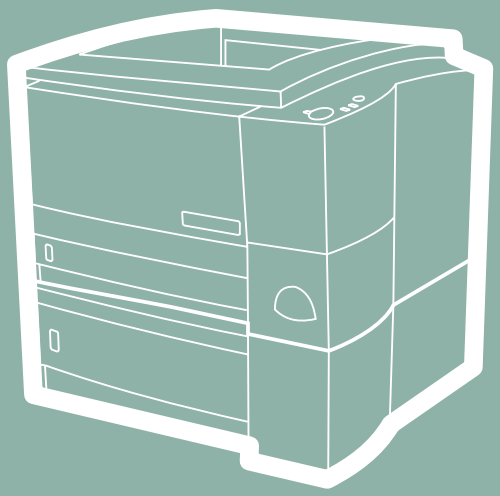

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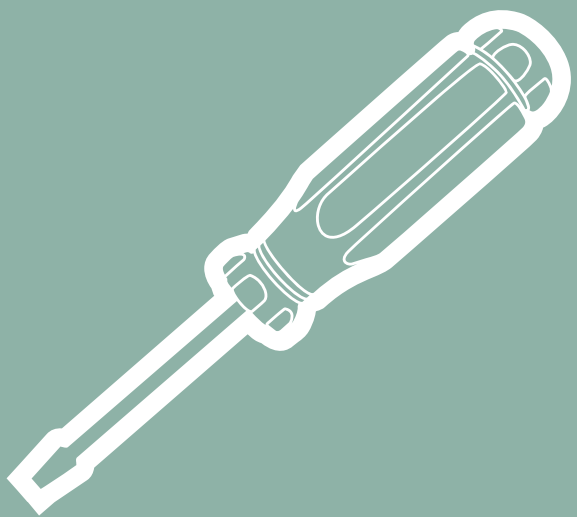

HP LaserJet 2200 Series Printer

Service Manual

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1 Product information

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Printer features

Table 1. Printer features for the HP LaserJet 2200 series printers

Speed	• 19 pages per minute (ppm) for letter-size print media, and 18 ppm for A4-size media (with 133 MHz Motorola Coldfire V4® microprocessor). • Instant-on fuser provides first page out in less than 15 seconds from warm or cold start (simplex) and less than 26 seconds using duplex.
Resolution	• HP FastRes 1200 (1200-dpi like quality at up to 19 ppm letter and 18 ppm A4). • HP ProRes 1200 (true 1200 by 1200 dpi text and graphics). • Adjustable line screen settings of 141 to 180 lines per inch to optimize print quality.
Toner	• HP UltraPrecise toner cartridge. Capacity rated at average 5,000 pages with 5 percent coverage. • EconoMode capability (saves up to 50 percent of toner at 600 dpi).
Flexible media handling	HP LaserJet 2200d and 2200dn printers: • Tray 1 is a 100-sheet or 10-envelope multipurpose tray for automatic and manual feeding of letterhead, envelopes, labels, transparencies, custom-sized media, postcards, and heavy paper (3 by 5 inch to legal size). • Tray 2 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • Two output bins: select either the top output bin or the rear output bin for the most convenient output location. • Standard output capacity of 150 sheets in the top output bin and 100 sheets in the rear output bin. • Straight-through paper path capability from tray 1 to the rear output bin. • Paper input level indicators. • Printing on both sides of paper, or duplex printing, is a standard feature of the printer, with the duplexer integrated into the paper path. HP LaserJet 2200dt and 2200dtn printer: • Tray 1 is a 100-sheet or 10-envelope multipurpose tray for automatic and manual feeding of letterhead, envelopes, labels, transparencies, custom-sized media, postcards, and heavy paper (3 by 5 inch to legal size). • Tray 2 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • For the HP LaserJet 2200dt, tray 3 is a 250-sheet tray that supports letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5, and 8.5 by 13 inch print media. • For the HP LaserJet 2200dtn, tray 3 is a 500-sheet tray that supports letter and A4-size paper. • Two output bins: select either the top output bin or the rear output bin for the most convenient output location. • Standard output capacity of 150 sheets in the top output bin and 100 sheets in the rear output bin. • Straight-through paper path capability from tray 1 to the rear output bin. • Paper input level indicators. • Printing on both sides of paper, or duplex printing, is a standard feature of the printer, with the duplexer integrated into the paper path.
Expandability	• All models accept tray 3, a 250-sheet or 500-sheet feeder to hold additional print media. • Enhanced input/output (EIO) cards. • Dual inline memory module (DIMM) slots for adding memory and fonts.

Table 1. Printer features for the HP LaserJet 2200 series printers (continued)

PCL printer language and fonts	• Fast printing performance, built-in Intellifont and TrueType™ scaling technologies, built-in HP-GL/2 vector graphics, and advanced imaging capabilities are benefits of the PCL 6 printer language. PCL 6 also includes 45 scalable TrueType fonts and one bitmapped Line Printer Font.
PS language and fonts	• PostScript® (PS) Level 2 emulation with 35 built-in PS language fonts included.
Automatic language switching	• The printer automatically determines and switches to the appropriate language for the print job.
Wireless printing	• The printer supports wireless printing from an IrDA-compliant device, such as a notebook computer, camera, cell phone, or a personal digital assistant (PDA). • IrReady 2000.
Interface connection	• Bidirectional ECP type-B parallel port (IEEE-1284 compliant). • Universal serial bus (USB) port. • EIO slot. • Wireless Fast Infrared port (IrDA compliant).
Networking	• The printer provides an EIO slot for HP JetDirect EIO print servers for fast and easy connectivity. HP 610N JetDirect print server included with HP LaserJet 2200dn and 2200dtn.
Enhanced memory and memory expansion	• The HP LaserJet 2200 series printers come with 8 MB of memory and can be expanded to 72 MB with the two available memory (DIMM) slots.
Energy savings	• The printer automatically conserves electricity by substantially reducing power consumption when not printing. • As an ENERGY STAR® partner, Hewlett-Packard Company has determined that this product meets ENERGY STAR® guidelines for energy efficiency.
Economical printing	• N-up printing and two-sided printing with the built-in duplexer conserves print media. • EconoMode conserves toner. • For tips to reduce the amount of print media used or extend the life of the toner cartridge see the user guide.
Duty cycle	• 40,000 pages per month average.

Identification

The model number and printer serial number are listed on an identification label located on the rear output bin. The model number is alphanumeric, such as C7058A for the HP LaserJet 2200 printer.

The serial number contains information about the country of origin, the revision level, the production code, and canon serial number of the printer. An example of a serial number is USBB**X**12345.

The top label also contains power rating and regulatory information. See figure 1.

Note The power rating and regulatory information vary by region.

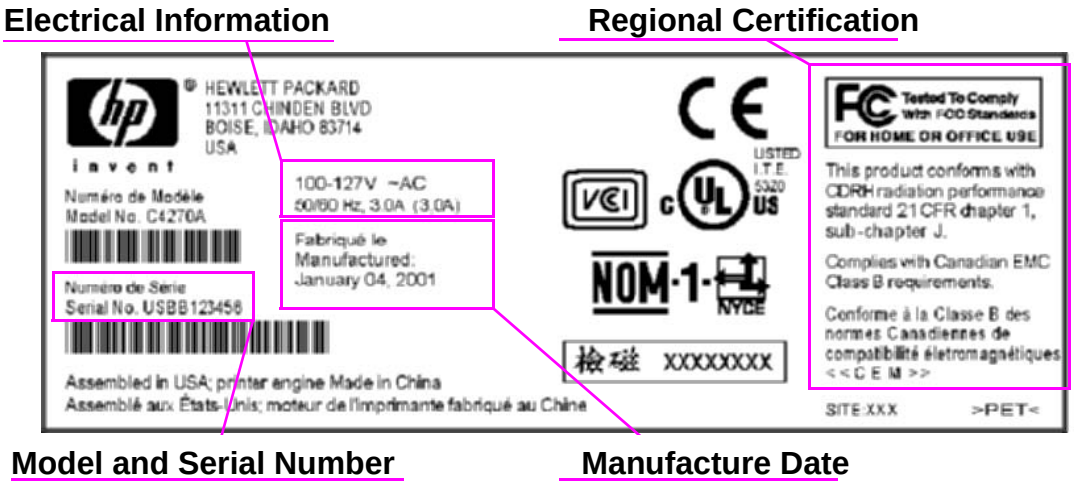

Figure 1. **Sample identification label**

Specifications

Table 2. Configuration comparison

	HP LaserJet 2200d	HP LaserJet 2200dn	HP LaserJet 2200dt	HP LaserJet 2200dtn
Standard memory Maximum memory	8 MB 72 MB	8 MB 72 MB	8 MB 72 MB	16 MB 72 MB
PS Level 2 emulation	Standard	Standard	Standard	Standard
JetDirect 610N print server	Optional	Standard	Optional	Standard
Duplex printing	Standard	Standard	Standard	Standard
250-sheet feeder *	Optional	Optional	Standard	Optional
500-sheet feeder *	Optional	Optional	Optional	Standard

Note * A 250-sheet feeder and 500-sheet feeder cannot be installed at the same time.

Table 3. Physical specifications

	HP LaserJet 2200d/ 2200dn	HP LaserJet 2200dt	HP LaserJet 2200dtn
Height	259.2 mm (10.25 in)	361.7 mm (14.24 in)	396.7 mm (15.62 in)
Width	417.9 mm (16.45 in)	417.9 mm (16.45 in)	417.9 mm (16.45 in)
Depth	434.6 mm (17.11 in)	434.6 mm (17.11 in)	434.6 mm (17.11 in)
Weight (with toner cartridge)	12.8 kg (28.219 lb)	15.8 kg (34.833 lb)	17.4 kg (38.360 lb)

Table 4. Electrical specifications

Volts	Frequency	Amperes (A)	Watts (W) (typical)
100 to 127 Vac ± 10 percent	50/60 Hz ± 3 Hz	Minimum recommended current capacity = 5 amps	printing = 400 W standby = 12 W PowerSave on = 12 W off = 0 W (EPA ENERGY STAR®)
220 to 240 Vac ± 10 percent	50/60 Hz ± 3 Hz	Minimum recommended current capacity = 2.5 amps	printing = 400 W standby = 12 W PowerSave on = 12 W off = 0 W (EPA ENERGY STAR®)

WARNING! Power requirements are based on the region where the printer is sold. Do not convert operating voltages. This can damage the printer and void the product warranty.

The following environmental specifications must be maintained to ensure the correct operation of the printer. Consider the following points before installing the printer:

- Place the printer on a sturdy, level surface.
- Allow adequate space around the printer for unimpeded operation.
- Install the printer in a well-ventilated room.
- Prevent exposure to direct sunlight or chemicals, including ammonia-based cleaning solutions.
- Ensure that an adequate power supply is used.
- Install the printer in a stable environment that experiences no abrupt temperature or humidity changes.

Table 5. Environmental specifications

	Operating/printing	Storage/standby
Temperature (printer and toner cartridge)	10 degrees to 32.5 degrees C (50 degrees to 90.5 degrees F)	-20 degrees to 40 degrees C (-4 degrees to 104 degrees F)
Relative humidity	20 percent to 80 percent	10 percent to 90 percent

Table 6. Noise-level specifications

	Operator position	Bystander (1m)	Sound power
Printing at 18 ppm	L_{pAm} 58 db(A)	L_{pAm} 51 db(A)	L_{WAd} 6.5 db(A)
Powersave	L_{pAm} inaudible	L_{pAm} inaudible	L_{WAd} inaudible

Note Testing per International Standards Organization (ISO) 9296

External assembly locations

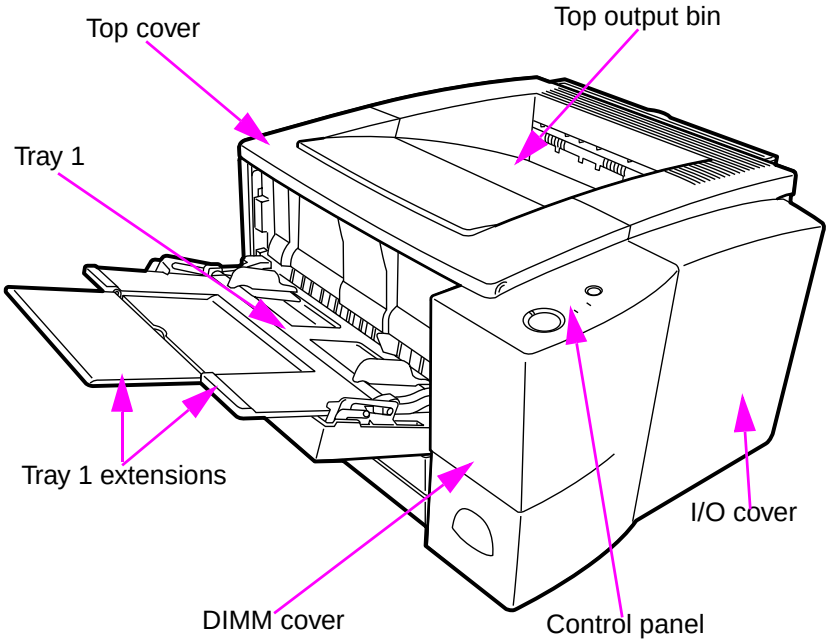

Figure 2. **External assembly locations (1 of 5)**

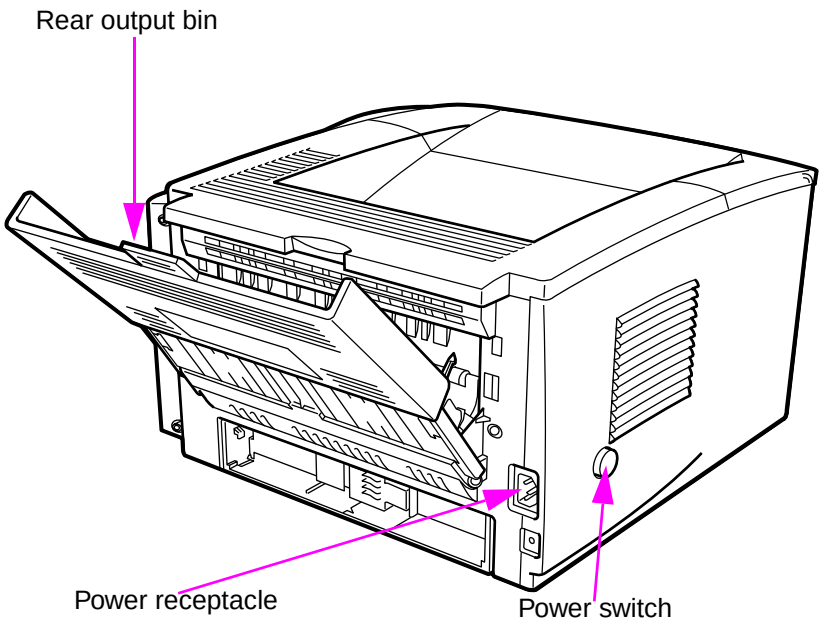

Figure 3. **External assembly locations (2 of 5)**

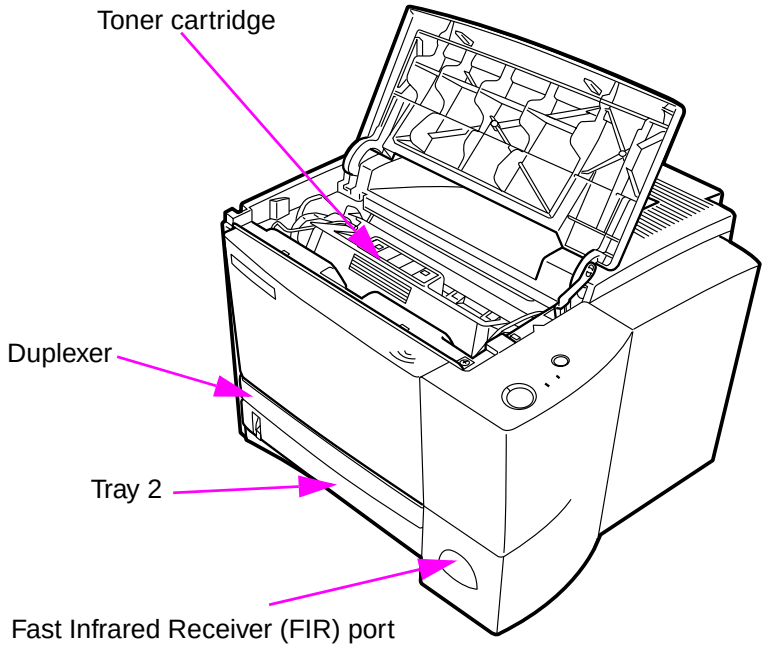

Figure 4. **External assembly locations (3 of 5)**

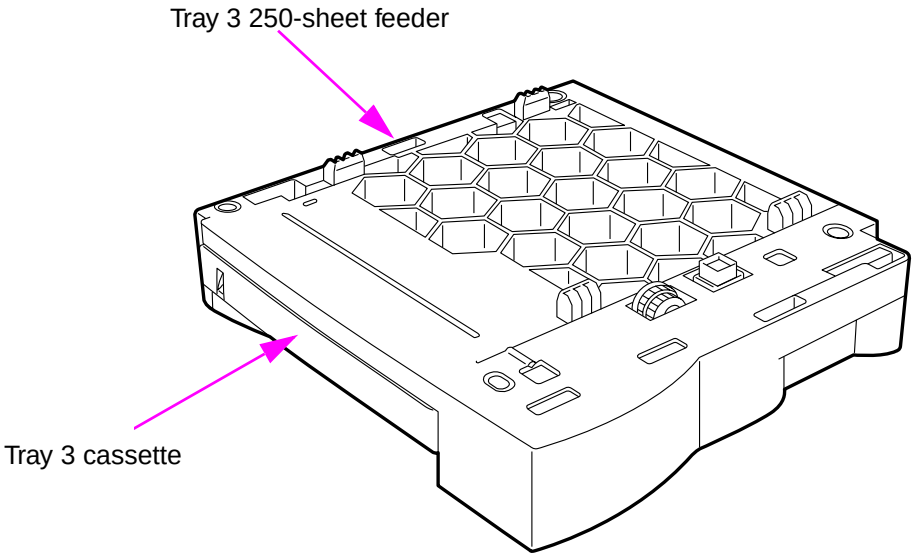

Figure 5. **External assembly locations (4 of 5)**

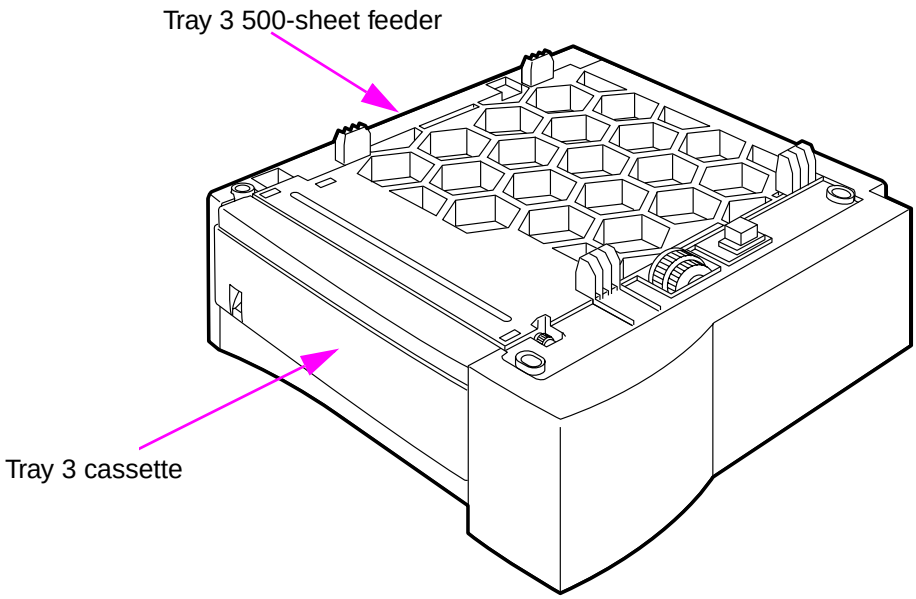

Figure 6. **External assembly locations (5 of 5)**

Internal assembly locations

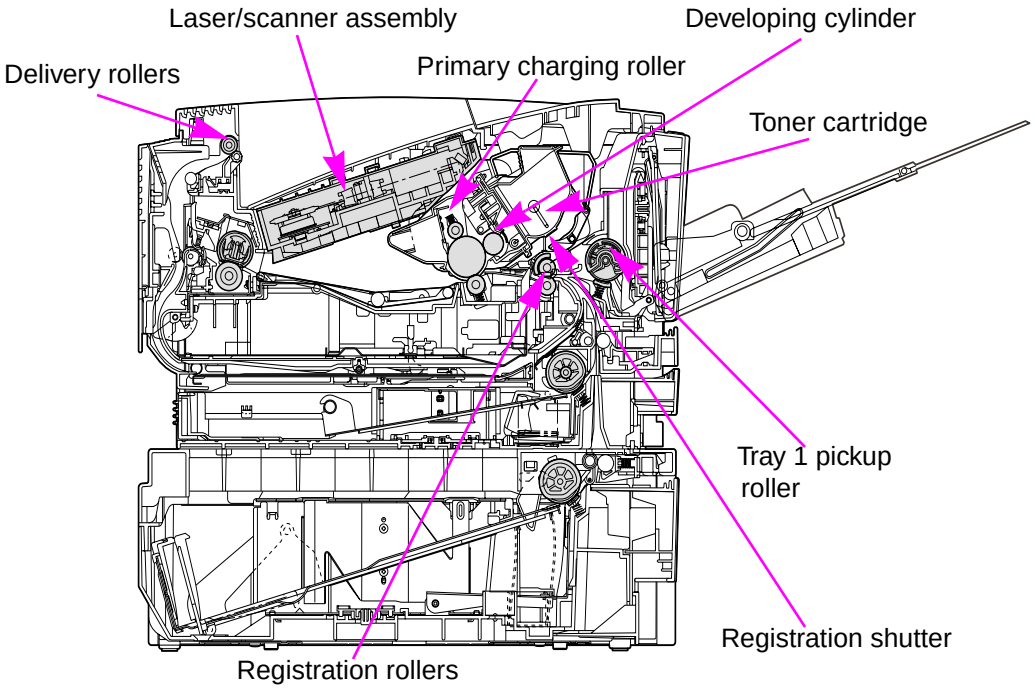

Figure 7. **Internal assembly locations (1 of 2)**

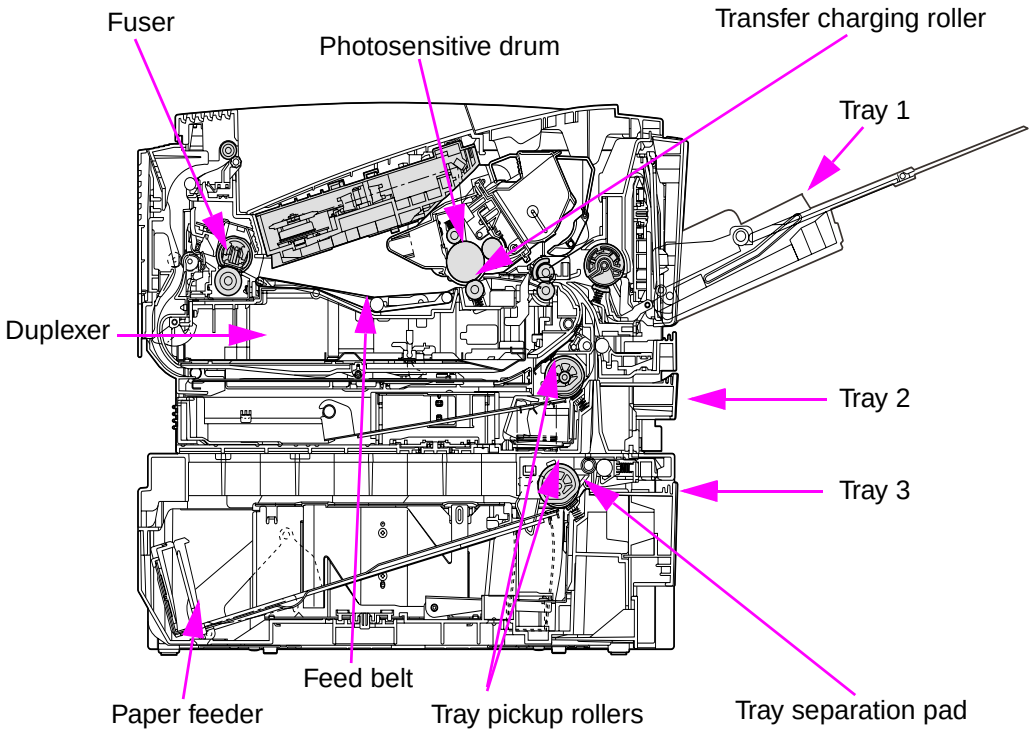

Figure 8. **Internal assembly locations (2 of 2)**

Safety information

Toner safety

Handling and storage

WARNING! Keep toner cartridges and toner particles away from excessive heat, sparks, and open flames.

If toner is spilled, avoid breathing in toner particles. Inhalation of toner particles causes respiratory tract irritation. Vacuum or sweep the material into a bag or other sealed container. A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

WARNING! Do not vacuum toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to a conventional vacuum.

Dispose of waste toner in accordance with local requirements. Do not discharge toner particles in drains.

First aid measures

- **Ingestion**. If toner is ingested, rinse mouth out thoroughly with water and drink several glasses of water. Get medical attention if symptoms persist.
- **Inhalation**. If toner particles are inhaled, move to fresh air immediately. If symptoms occur, consult a physician.
- **Eye contact**. If toner comes in contact with the eyes, immediately flush with plenty of water for at least 15 minutes. If irritation persists, consult a physician.
- **Skin contact**. If toner spills on skin, remove as much toner as possible with a dry tissue, and then wash with cold water.

Clothing contact

Note Toner can stain clothing. Hot water or heat (from a clothes dryer) can cause toner to melt and permanently fuse to clothing.

Clothing is best cleaned by removing as much toner as possible with a dry tissue, and then washing with cold water. Air-dry clothing.

Additional information

The Toner Cartridge/Drum Material Safety Data Sheet (MSDS) can be obtained by contacting HP at the following website:
http://www.hp.com/go/msds

Laser safety

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States. The printer is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968.

Because radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

WARNING! Using controls, making adjustments, bypassing safety switches, or performing procedures other than those specified in this service manual can result in exposure to hazardous radiation.

LED safety

The infrared port on the control panel of this printer is classified as a Class 1 LED (light emitting diode) device according to International Standard IEC 60825-1 (EN 60825-1). This device is not considered harmful, but the following precautions are recommended.

- Avoid direct eye exposure to the infrared LED beam.
- Be aware that the beam is invisible light and cannot be seen.
- Do not attempt to view the infrared LED beam with any type of optical device.

Regulatory information

For regulatory information and requirements, please see the user guide.

FCC regulations

For FCC regulations, please see the user guide.

Declaration of conformity

For declaration of conformity information, please see the user guide.

Environmental Product Stewardship Program

Protecting the environment

Hewlett-Packard Company is committed to providing quality products in an environmentally sound manner. This product has been designed with several attributes to minimize impacts on our environment.

Ozone production

This product generates no appreciable ozone gas (O3).

Energy consumption

Energy usage drops significantly while the printer is in PowerSave mode, which saves natural resources and saves money without affecting the performance of the printer. This product qualifies for ENERGY STAR ® which is a voluntary program established to encourage the development of energy-efficient office products.

ENERGY STAR ® is a U.S. registered service mark of the United States Environmental Protection Agency. As an ENERGY STAR ® partner, Hewlett-Packard Company has determined that this product meets the ENERGY STAR ® guidelines for energy efficiency. For more information, see

http://www.epa.gov/energystar/

Toner consumption

EconoMode uses significantly less toner, which might extend the working life of the toner cartridge.

Paper use

This product's duplex feature (two-sided printing) and N-up printing capability (multiple pages printed on one sheet of paper) can reduce paper usage and the resulting demands on natural resources.

Plastics

Plastic parts more than 25 grams in weight are marked according to international standards that enhance the ability to identify plastics for recycling purposes at the end of the product's life.

HP LaserJet printing supplies

In many countries, this product's printing supplies (for example: toner cartridge, drum, fuser) can be returned to HP through the HP Printing Supplies Returns and Recycling Program. An easy-to-use takeback program is available in more than 25 countries. Multilingual program information and instruction are included in every new HP LaserJet toner cartridge and consumables package.

HP Printing Supplies Environmental Program information

Since 1990, the HP Printing Supplies Returns and Recycling Program has collected more than 39 million used LaserJet toner cartridges that otherwise might have been discarded in the world's landfills. The HP LaserJet toner cartridges and consumables go to a collection center and are bulk-shipped to our resource and recovery partners who disassemble the cartridge's for recycling. After a through quality inspection, selected parts are reclaimed for use in new cartridges. Remaining materials are separated and converted into raw materials for use by other industries to make a variety of useful products.

US returns

For a more environmentally responsible return of used cartridges and consumables, HP encourages the use of bulk returns. Simply bundle two or more cartridges together and use the single, pre-paid, pre-addressed UPS label that is supplied in the package. For more information in the United States, call (1) (800) 340-2445 or visit the HP LaserJet Supplies website at

http://www.ljsupplies.com/planetpartners/.

Outside the US returns

Outside the US customers should call the local HP sales and service office for further information regarding availability of the HP Supplies Returns and Recycling Program.

Paper

This printer is suited for the use of recycled papers when the paper meets the guidelines outlined in the *HP LaserJet Printer Family Print Media Guide*. Also, this printer is suitable for the use of recycled paper according to DIN 19309.

Material safety data sheet

Material Safety Data Sheets (MSDS) can be obtained by contacting the HP LaserJet Supplies website at http://www.hp.com/go.msds. In the United States, if you do not have access to the internet, call the U.S. HP FIRST (fax on demand service) at (1) (800) 231-9300. Use index number seven for a listing of the material safety data sheets. Outside the US, see "Worldwide offices"in table 8 for appropriate phone numbers and information.

Service approach

Bench repair warranty

The warranty for this product is “return to bench” for a period of one year from the date of purchase. This means that customers needing warranty repair must return their printer to an HP repair center or an Authorized Service Provider (ASP). See “Reseller sales and service support” on page 17.

HP Express Exchange

Through Customer Care Centers In the United States and Canada, customers have an option to initiate Express Exchange. Under this option, customers can have a factory-refurbished printer sent to them within 24 hours.

1. The customer contacts the local HP Customer Care Center listed in the product documentation. A technician troubleshoots the situation and determines whether the printer has actually failed. If so, the technician refers the customer to the HP Service Center.
2. A representative from the service center requests product and customer information. In some regions, collateral might also be requested.
3. Hewlett-Packard Company ships a refurbished replacement unit to arrive the next day. (Geographic distance might prevent next-day shipping.)
4. The customer sends the defective printer to Hewlett-Packard at HP's expense.

Customers with onsite support service provided by HP should work directly with the local Customer Care Center instead of following the steps outlined here.

Exchanged units carry the remainder of the original unit’s warranty or a 90-day warranty, whichever is greater. The faster turnaround from HP Express Exchange minimizes downtime over traditional service programs that require the user to ship the failed unit to the manufacturer and then wait for it to be repaired and returned. Because HP pays the shipping charges, the user incurs no hidden costs for the service.

Note For warranty information and requirements, please see the user guide.

Ordering information

"Ordering parts" in chapter 8 of this manual contains factory replacable unit (FRU) and accessory part numbers. Replacement parts can be ordered from the HP Customer Services and Support Organization.

Use only accessories specifically designed for this printer. Order accessories from an authorized service or support provider. See “HP Direct ordering for genuine HP parts” on page 16.

Note See page ‘Worldwide sales and service offices” on page 18 for a local HP office in the appropriate region.

Supplemental documentation

Table 7. Supplemental documentation

Document	Description	Part number
Hp Laserjet Printer Family Print Media Guide	A guide to using paper and other print media with HP LaserJet printers.	5963-7863
Laserjet User Guide	A printed copy of the user guide	English C7058-90915 Arabic C7058-90911 Czech C7058-90912 Danish C7058-90913 Dutch C7058-90914 Finnish C7058-90916 French C7058-90917 German C7058-90918 Greek C7058-90919 Hebrew C7058-90920 Hungarian C7058-90921 Italian C7058-90922 Korean C7058-90923 Norwegian C7058-90924 Portuguese Brazilian C7058-90925 Polish C7058-90926 Russian C7058-90927 Simplified Chinese C7058-90928 Slovak C7058-90929 Spanish Castilian C7058-90930 Swedish C7058-90931 Traditional Chinese C7058-90932 Thai C7058-90933 Turkish C7058-90934
Hp Laserjet 2200 Getting Started Guide	A printed copy of the getting started guide	C7058-00901 (English version)
Hp Laserjet 2200 User CD-ROM	English, German, Dutch, French, Spanish, Italian, Portuguese Brazilian, Finnish, Swedish, Norwegian, Danish, Arabic	C7058-60106
Hp Laserjet 2200 User CD-ROM	English, Turkish, Russian, Hungarian, Polish, Czech, Hebrew, Greek, Slovak	C7058-60108
HP LaserJet 2200 User CD-ROM	English, Thai, Korean, Simplified Chinese, Traditional Chinese	C7058-60107
HP LaserJet 2200 sErvice and Support CD-ROM	English	C7058-60105

HP Direct ordering for genuine HP parts

- Customer Services and Support Organization (CSSO)
  (1) (800) 227-8164 (U.S. only)
- CSSO (in Europe only)
  (49 7031) 142253

Consumables

Paper and toner cartridges can be ordered directly from Hewlett-Packard. See “HP Direct ordering for genuine HP parts” on page 16.

World Wide Web

Printer drivers, updated HP printer software, and product and support information can be obtained from the following URL:
in the U.S. http://www.hp.com/support/lj2200

Printer drivers can be obtained from the following sites:

- China, ftp://www.hp.com.cn/support/lj2200
- Japan, ftp://www.jpn.hp.com/support/lj2200
- Korea, http://www.hp.co.kr/support/lj2200
- Taiwan, http://www.hp.com.tw/support/lj2200
  or the local driver website, http://www.dds.com.tw

HP service parts information compact disc

This powerful, CD-ROM-based parts information tool is designed to give users fast, easy access to parts information such as pricing and recommended stocking lists for a wide range of HP products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 336-5987. In Asia Pacific, call (65) 740-4484. Parts identification and pricing information can also be found on the World Wide Web at: http://www.hp.com/go/partsinfo

HP support assistant compact disc

This support tool offers a comprehensive online information system designed to provide technical and product information about Hewlett-Packard products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 457-1762. In Hong Kong, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

Reseller sales and service support

The HP Customer Care Center is available to assist resellers and service technicians. You can reach this support center in the U.S. or Canada at (1) (800) 544-9976.

HP authorized resellers and support

To locate authorized HP resellers and support, call (1) (800) 243-9816 in the U.S. or (1) (800) 387-3867 in Canada.

HP service agreements

Call (1) (800) 743-8305 in the U.S. or (1) (800) 268-1221 in Canada.

Other areas

Outside of North America and Europe, contact your local HP sales office for assistance in obtaining technical support for resellers and service technicians. See “Technical assistance” on page 18.

Technical assistance

Worldwide sales and service offices

Note Before calling an HP sales and service office, be sure to contact the appropriate HP Customer Care Center. Products should not be returned to these offices. Product return information is also available through the appropriate HP Customer Care Center.

Table 8. Worldwide offices

Argentina	Hewlett-Packard Argentina S.A. Montañeses 2140/50/60 1428 Buenos Aires Phone: (54 11) 4787-7100 Fax: (54 11) 4787-7213
Australia	Hewlett-Packard Australia Ltd. 31-41 Joseph Street Blackburn, VIC 3130 Phone: (61) (3) 272-2895 Fax: (61) (3) 898-7831 Hardware Repair Center: Phone: (61) (3) 272-8000 Extended Warranty Support: Phone: (61) (3) 272-2577 Customer Information Center: Phone: (61) (3) 272-8000
Austria	Hewlett-Packard GmbH Lieblgasse 1 A-1222 Vienna Phone: (43) (1) 25000-555 Fax: (43) (1) 25000-500
Belgium	Hewlett-Packard Belgium S.A. NV Boulevard de la Woluwe-Woluwedal 100-102 B-1200 Brussels Phone: (32) (2) 778-31-11 Fax: (32) (2) 763-06-13
Brazil	Hewlett-Packard Brazil SA R. Aruana 125 Tambore - Barueri - SP 06460-010 Phone: (0xx11) 829-6612 Fax: (0xx11) 829-0018
Bulgaria	Hewlett-Packard Bulgaria EOD Vaptzarov Blvd., 1407 Sofia Phone: (35) (9) 296-019 40 Fax: (35) (9) 296-019 88

Table 8. Worldwide offices

Canada	Hewlett-Packard (Canada) Ltd. 17500 Trans Canada Highway South Service Road Kirkland, Québec H9J 2X8 Phone: (1) (514) 697-4232 Fax: (1) (514) 697-6941 Hewlett-Packard (Canada) Ltd. 5150 Spectrum Way Mississauga, Ontario L4W 5G1 Phone: (1) (905) 206-4725 Fax: (1) (905) 206-4739
Chile	Hewlett-Packard de Chile Avenida Andres Bello 2777 of. 1 Los Condes Santiago, Chile
China	China Hewlett-Packard Co. Ltd. 9/F, HP Building No.2 Dong San Huan Nan Lu Chao Yang District Beijing 100022, P.R. China Phone: 86-10-6564-3888 Fax: 86-10-6566-8280
Colombia	Hewlett-Packard Colombia Calle 100 No. 8A -55 Torre C Oficina 309 Bogotá, Colombia
Croatia	Hewlett-Packard Trading S.A. Cibona Business Tower TRG Drazena Petrovica 3/13 10000 Zagreb Phone: (385) (1) 488-1000 Fax: (385) (1) 488801010
Czech Republic	Hewlett-Packard s. r. o. Vyskocilova 1/1410 CZ-140-21 Praha Czech Republic Phone: (420) (2) 613-07111 Fax: (420) (2) 61307 613
Denmark	Hewlett-Packard A/S Kongevejen 25 DK-3460 Birkerød Denmark Phone: (45)3929 4099 Fax: (45) 4281-5810
Far East Region	Hewlett-Packard Asia Pacific Ltd. 17-21/F Shell Tower, Times Square 1 Matheson Street, Causeway Bay Hong Kong Phone: (852) 2599-7777 Fax: (852) 2506-9261 Hardware Repair Center: Phone: (852) 2599-7000 Extended Warranty Support: Phone: (852) 2599-7000 Customer Information Center: Phone: (852) 2599-7066

Table 8. Worldwide offices

Finland	Hewlett-Packard Oy Piispankalliontie 17 FIN-02200 Espoo Phone: (358) (9) 887-21 Fax: (358) (9) 887-2477
France	Hewlett-Packard France 42 Quai du Point du Jour F-92659 Boulogne Cedex Phone: (33) (146) 10-1700 Fax: (33) (146) 10-1705
Germany	Hewlett-Packard GmbH Herrenberger Straße 130 71034 Böblingen Phone: (49) (180) 532-6222 (49) (180) 525-8143 Fax: (49) (180) 531-6122
Greece	Hewlett-Packard Hellas 62, Kifissias Avenue Polis Center Maroussi 151 24 Athens Phone: (30) (1) 619-6411 Fax: (30) (1) 619-6512
Hungary	Hewlett-Packard Magyarország Kft. Info Park Neumann Janos u.1 H-1111 Budapest Phone: (36) (1) 382-6666 Fax: (36) (1) 382-6667 Hardware Repair Center: Phone: (36) (1) 343-0312 Customer Information Center: Phone: (36) (1) 343-0310
India	Hewlett-Packard India Ltd. Paharpur Business Centre 21 Nehru Place New Delhi 110 019 Phone: (91) (11) 647-2311 Fax: (91) (11) 646-1117 Hardware Repair Center and Extended Warranty Support: Phone: (91) (11) 642-5073 (91) (11) 682-6042
Israel	Hewlett-Packard Israel 11Hashlosha St. Tel-Aviv 67060 Phone: 972 3 5380300 Fax: 972 3 5380351
Italy	Hewlett-Packard Italiana SpA Via Giuseppe di Vittorio, 9 I-20063 Cernusco Sul Naviglio (Milano) Phone: (39) (2) 921-21 Fax: (39) (2) 921-04473

Table 8. Worldwide offices

Japan	Hewlett-Packard Japan, Ltd. 3-29-21 Takaido-higashi Suginami-ku, Tokyo 168 Phone: (81) (3) 3335-8333 Fax: (81) (3) 3335-8338 Hardware Repair Center: Phone: (81) (4) 7355-6660 Fax: (81) (4) 7352-1848
Kazakhstan	Hewlett-Packard International Trade BV Branch Office Kazakhstan 135 Ablay Khan Ave 480091 Almaty} Phone: (7) (3272) 980-824 Fax: (7) (33272) 980-825
Korea	Hewlett-Packard Korea, Ltd. HP Korea House
Yoido-dong	Youngdeungpo-gu Seoul 150-010 724 Phone: (82) (02) 7692 2199-0114 (02) 2199-0114 Fax: (82) (2) 784-7084 Hardware Repair Center: Phone: (82) (2) 3270-0700 (82) (2) 707-2174 (82) (2) 3270-0710 Extended Warranty Support: Phone: (82) (2) 3770-0365 (82) (2) 769-0500
Latin American Headquarters	5200 Blue Lagoon Drive Suite 950 Miami, FL 33126,USA Phone: (1) (305) 267-4220
México	Hewlett-Packard de México, S.A. de C.V. Prolongación Reforma No. 700 Lomas de Santa Fe 01210 México, D.F. Phone: 01-800-22147 Outside México City Phone: 01-800-90529
Middle East/Africa	ISB HP Response Center Hewlett-Packard S.A. Rue de Veyrot 39 P.O. Box 364 CH-1217 Meyrin - Geneva Switzerland Phone: (41) (22) 780-4111
Morocco Nortwest and Central Africa Branch	Hewlett-Packard Morocco, Sarl. Morocco Sales 17 Boulevard Moulay Youssef Casablanca, Morocco Phone: (212) (2) 22 13 40 Fax: (212) (2) 22 08 94
Netherlands	Hewlett-Packard Nederland BV Startbaan 16 NL-1187 XR Amstelveen Phone: (31) (020) 547-6666 Fax: (31) (020) 547-7755

Table 8. Worldwide offices

New Zealand	Hewlett-Packard (NZ) Limited Ports of Auckland Building Princes Wharf, Quay Street P.O. Box 3860 Auckland Phone: (64) (9) 356-6640 Fax: (64) (9) 356-6620 Hardware Repair Center and Extended Warranty Support: Phone: (64) (9) 0800-733547 Customer Information Center: Phone: (64) (9) 0800-651651
Norway	Hewlett-Packard Norge A/S Postboks 60 Skøyen Drammensveien 169 N-0212 Oslo Phone: (47) 2273-5600 Fax: (47) 2273-5610
Poland	Hewlett-Packard Polska Sp. z o.o. Ochota Office Park Al. Jerozolimskie 181 02-222 Warszawa Phone: (48-22) 608-7700 Fax: (48-22) 608-7600
Portugal	Hewlett-Packard Portugal Quinta da Fonte Edifico Bartolomeu Dias Porto Salvo 2780-667 Oeiras Portugal Phone: (351) (21) 4 82 85 00
Romania	Hewlett-packard Romania SRL Boulevard Carol I 34-36 NBC Modern, 10th floor Bucharest Phone: (40) (1) 205-33-00 Fax: (40) (1) 250-60 95
Russia	AO Hewlett-Packard Business Complex Building #2 129223, Moskva, Prospekt Mira VVC Phone: (7) (95) 797-3500 Fax: (7) (95) 797-3501
Singapore	Hewlett-Packard Singapore (Sales) Pte Ltd 450 Alexandra Road Singapore (119960) Phone: (65)275-3888 Fax: (65)275-6839Hardware Repair Center and Customer Information Center: Phone: (65) 272-5300 Extended Warranty Support: Phone: (65) 272-5333
Slovakia	Hewlett-Packard Slovakia s.r.o. Kutlikova 17 85250 Bratislava Phone: (42) (1) 7 682-090 Fax: (42) (1) 382-6777

Table 8. Worldwide offices

South Africa	Hewlett-Packard South Africa 9 Eastern Services Road Eastgate Ext.3 Sandton 2148 Private Bag Wendwood 2144 Republic of South Africa Phone: 27 11 8 06 1000 Fax: 27 11 444 1725
Spain	Hewlett-Packard Española, S.A. Carretera de la Coruña km 16.500 E-28230 Las Rozas, Madrid Phone: (34) 91-6311600 Fax: (34) 91-6311830
Sweden	Hewlett-Packard Sverige AB Skalholtsgatan 9 S-164 97 Kista Phone: (46) (8) 444-2000 Fax: (46) (8) 444-2666
Switzerland	Hewlett-Packard (Schweiz) AG In der Luberzen 29 CH-8902 Urdorf/Zürich Phone: (41) (0848) 88 44 66 Fax: (41) (1) 735-77 0 Warranty Support: (41) (0848) 80 11 11
Taiwan	Hewlett-Packard Taiwan Ltd. 8th Floor 337, Fu-Hsing North Road Taipei, 10483 Phone: (886)(02)717-0055 FAX: (886)(02)514-0276 Hardware Repair Center, call: North (886)(02) 717-9673 Central (886)(04) 327-0153 South (886)(080)733-733 Extended Warranty Support Contact: Phone: (886)(02) 714-8882
Thailand	Hewlett-Packard (Thailand) Ltd. 23-25/f Vibulthani Tower II 2199 Rama 4 Rd, Klongton Klintoey, Bangkok 10110 Thailand Phone: (66) (2) 666-3900-34 Fax: (66) (2) 666-3935-37 Hardware Repair Center and Extended Warranty Support Contact: Phone: (66) (2) 661-3900 ext. 6001/ 6002 Customer Information Center: Phone: (66) (2) 661-3900 ext. 3211 Fax: (66) (2) 661-3943
Turkey	Hewlett-Packard Company Bilgisayar Ve ölçüm Sistemleri AS 19 Mayis Caddesi Nova Baran Plaza Kat: 12 80220 Sisli-Istanbul Phone: (90) (212) 224-5925 Fax: (90) (212) 224-5939

Table 8. Worldwide offices

Ukraine	Hewlett-Packard Trading S. A. 14, Bekhterevskiy Pereulok, Block E 04053 Kiev Phone: (380) 44 490 61 20 Fax: (380) 44 490 61 21
United Arab Emirates	Hewlett-Packard Middle East P.O. Box 17295 Jebel Ali Free Zone Dubai,U.A.E Phone: (97) 14 88 15 456 Fax: (97) 14 88 14 529
United Kingdom	Hewlett-Packard Ltd. Cain Road Bracknell Berkshire RG12 1HN Phone: (44) (134) 436-9222 Fax: (44) (134) 436-3344
Venezuela	Hewlett-Packard de Venezuela S.A. Los Ruices Norte 3A Transversal Edificio Segre Caracas 1071 Phone: (58) (2) 239-4244 Fax: (58) (2) 239-3080

2 Operating requirements

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Operating environment

The electrical and environmental specifications must be maintained to ensure the proper operation of this printer. See "Specifications" in chapter 1. Consider the following points before installing the printer:

- Install in a well-ventilated, dust-free area.
- Install on a level, flat, and continuous surface that can support the printer's weight. Make sure all four printer feet are level. Do not install on carpet or other soft surfaces.
- Ensure adequate power supply circuitry. See "Specifications" in chapter 1.
- Install where there is stable temperature and humidity, with no abrupt changes (away from water sources, humidifiers, air conditioners, refrigerators, or other major appliances). See "Specifications" in chapter 1.
- Install away from direct sunlight, areas with vibration, open flames, ultrasonic heaters, ammonia fumes, or magnets and devices that emit a magnetic field. If the printer is placed near a window, make sure the window has a curtain or blind to block any direct sunlight.
- Maintain enough space around the printer for proper access and ventilation. See “Printer space requirement” on page 27

Printer space requirement

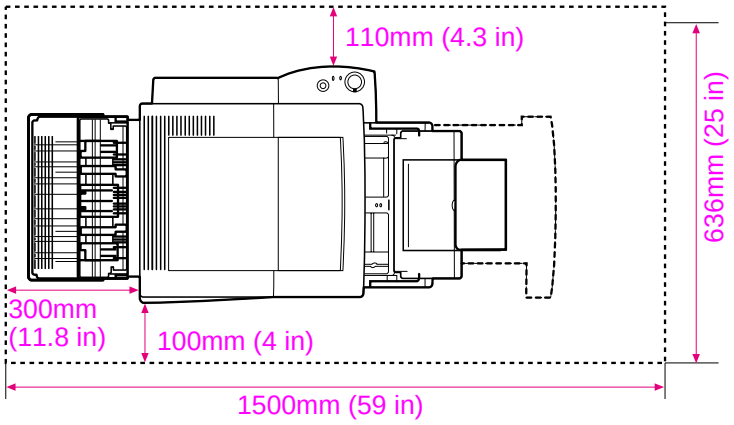

Figure 9. **Top view**

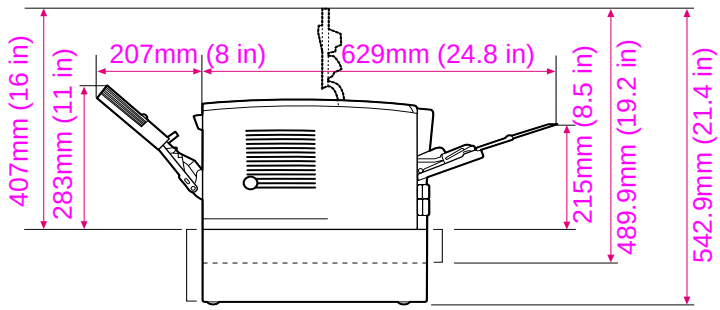

Figure 10. **Side view**

Media specifications

General media specifications

The HP LaserJet 2200 series printers accept a variety of media, such as cut-sheet paper (including up to 100 percent recycled-fiber-content paper), envelopes, labels, transparencies, and custom-size paper. Properties such as weight, composition, grain, and moisture content are important factors affecting printer performance and output quality. Media that does not meet the guidelines outlined in this manual can cause the following problems:

- poor print quality
- increased jams
- premature wear on the printer, requiring repair

Note Some print media might meet all of the guidelines in this manual and still not produce satisfactory results. This might be the result of improper handling, unacceptable temperature and humidity levels, or other variables over which Hewlett-Packard has no control.

CAUTION Using print media that does not meet HP specifications might cause problems for the printer, requiring repair. This repair is not covered by the Hewlett-Packard warranty or service agreements.

Note Before purchasing large quantities of paper, make sure the paper meets the requirements specified in this service manual and in the *HP LaserJet Printer Family Print Media Guide.* See “Supplemental documentation” on page 16 Always test print media before buying large quantities. For more information see the *HP LaserJet Printer Family Print Media Guide at* http://www.hp.com/cposupport/printers/manuals/

Guidelines for selecting paper

For best results, use conventional 80 g/m^2 (20 lb) paper. Make sure the paper is of good quality, and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, and curled or bent edges.

If you are unsure what type of paper you are loading (such as bond or recycled), check the label on the package of paper.

The following problems with paper can cause print quality deviations, jamming, or even damage to the printer.

Table 9. Guidelines for selecting paper

Symptom	Problem with paper	Solution
Poor print quality, toner adhesion, or problems with feeding	Too moist, too rough, too heavy, too smooth, or embossed; faulty paper lot	Try another kind of paper, between 100 and 250 Sheffield, 4 percent to 6 percent moisture content
Dropouts, jamming, or curl	Stored improperly Side-to-side variability of paper	Store paper flat in its moisture-proof wrapping Turn paper over
Increased gray background shading, or printer wear	Too heavy	Use lighter paper; open the rear output bin
Excessive curl or problems with feeding	Too moist, wrong grain direction, or short-grain construction Side-to-side variability of paper	Open the rear output bin; use long-grain paper Turn paper over
Jamming or damage to printer	Cutouts or perforations	Do not use paper with cutouts or perforations
Problems with feeding	Ragged edges Side-to-side variability of paper	Use good, high-quality paper Turn paper over

Media input options

The printer comes with two built-in paper trays, tray 1 and tray 2. Tray 3 is an optional tray that can be added to the printer. By default, the printer draws first from tray 1. If tray 1 is empty, the printer draws from tray 2. If tray 1 is empty and tray 3 is installed, the printer draws from tray 3 first and then tray 2.

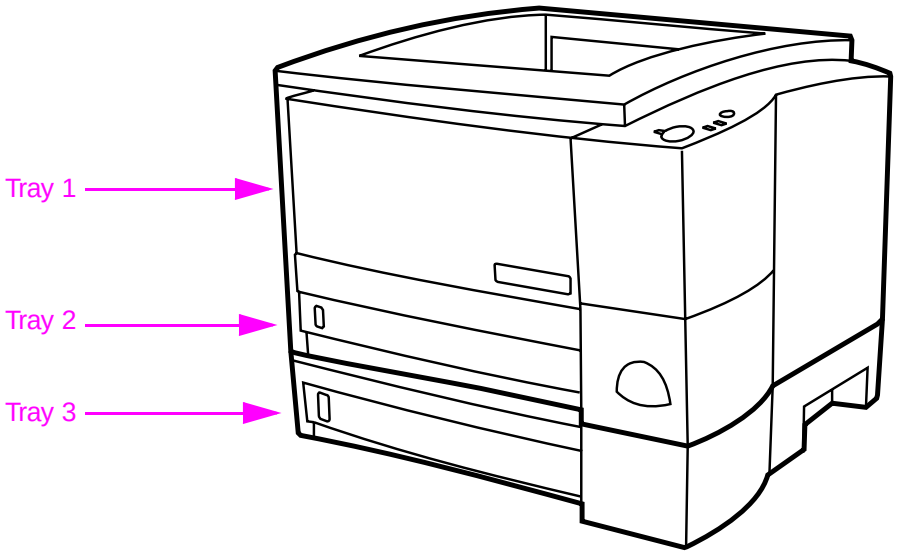

Figure 11. **Media input trays (250-sheet feeder installed)**

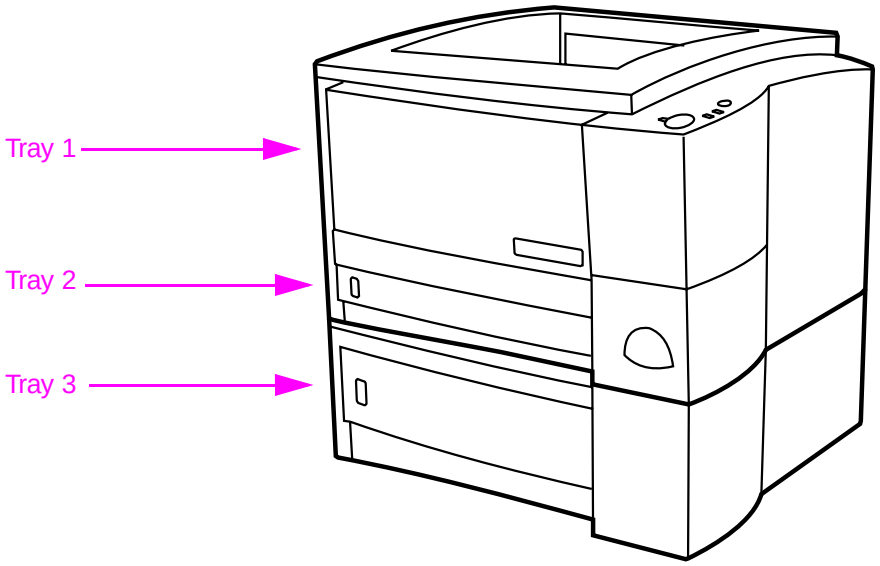

Figure 12. **Media input trays (500-sheet feeder installed)**

Note The printer supports a wide range of media sizes. Check the printer software for supported sizes. Capacity can vary depending on media weight and thickness and on environmental conditions. Smoothness should be between 100 and 250 (Sheffield).

- For information about measuring basis weight, see "Basis-weight field test" on page 37.
- For information about measuring caliper, see "Caliper field test" on page 39.
- For information about smoothness, see "Paper-finish field test" on page 39.

Tray 1 media sizes

Tray 1 adjusts for sizes from 76 by 127 mm (3 by 5 in) to 216 by 356 mm (8.5 by 14 in). Send media from tray 1 to the rear output bin when printing on the following:

- envelopes
- labels
- transparencies
- custom-sized media or cardstock
- postcards

Table 10. Tray 1 media sizes

Tray 1	Dimensions	Weight	Capacity
Minimum size (custom)	76 by 127 mm (3 by 5 in)	60 to 163 g/m^2 (16 to 43 lb bond)	100 sheets of 75 g/m^2 (20 lb bond) paper
Maximum size (custom)	216 by 356 mm (8.5 by 14 in)		
Transparency	Same as minimum and maximum paper sizes listed above	Thickness: .10 to .14 mm (0.0039 to 0.0055 in)	75 typical
Labels		Thickness: .10 to .14 mm (0.0039 to 0.0055 in)	50 typical
Envelopes		Up to 90 g/m^2 (16 to 24 lb)	Up to 10

Note Users might experience jams when using any media with a length less than 178 mm (7 in). This can be caused by paper that has been affected by environmental conditions. For optimum performance, make sure that users are storing and handling the paper correctly.

Tray 2 and tray 3 (250-sheet feeder)

Tray 2 and the tray 3 (250-sheet feeder) have settings for the paper sizes shown in table 11. Use only standard copier paper when printing from tray 2 or tray 3 (250-sheet feeder). Other types of print media might jam when printing from tray 2 or tray 3 (250-sheet feeder).

Table 11. Tray 2 and tray 3 (250-sheet feeder) paper sizes

Tray 2	Dimensions	Weight	Capacity
Letter	216 by 279 mm (8.5 by 11 in)	60 to 105 g/m^2 (16 to 28 lb bond)	250 sheets of 75 g/m^2 (20 lb bond) paper
A4	210 by 297 mm (8.3 by 11.7 in)		
Executive	191 by 267 mm (7.3 by 10.5 in)		
Legal	216 by 356 mm (8.5 by 14 in)		
B5 (ISO)	176 by 250 mm (6.9 by 9.9 in)		
B5 (JIS)	182 by 257 mm (7.2 by 10 in)		
A5	148 by 210 mm (5.8 by 8.2 in)		
8.5 by 13 in	216 by 330 mm (8.5 by 13 in)		

Tray 3 (500-sheet feeder)

Tray 3 (500-sheet feeder) has settings for the paper sizes shown in table 12. Use only standard copier paper when printing from tray 3 (500-sheet feeder). Other types of print media might jam when printing from tray 3 (500-sheet feeder).

Table 12. Tray 3 (500-sheet feeder) paper sizes

500 sheet feeders	Dimensions	Weight	Capacity
Letter	216 by 279 mm (8.5 by 11 in)	60 to 105 g/m^2 (16 to 28 lb bond)	250 sheets of 75 g/m^2 (20 lb bond) paper
A4	210 by 297 mm (8.3 by 11.7 in)		

Table 13. Automatic duplexer paper sizes

Duplexer	Dimensions	Weight
Letter	216 by 279 mm (8.5 by 11 in)	60 to 105 g/m^2 (16 to 28 lb bond)
A4	210 by 297 mm (8.3 by 11.7 in)	
Legal	216 by 356 mm (8.5 by 14 in)	
8.5 by 13 in	216 by 330 mm (8.5 by 13 in)	

Envelope specifications

Envelope construction is critical. Envelope fold lines can vary considerably, not only between manufacturers, but also within a box from the same manufacturer. Successful printing on envelopes depends upon the quality of the envelopes. When selecting envelopes, consider the following components:

- **Weight:** The weight of the envelope paper should not exceed 105 g/m^2 (28 lb) or jamming can occur.
- **Construction:** Prior to printing, envelopes should lie flat with less than 6 mm (0.25 in) curl, and should not contain air.
- **Condition:** Envelopes should not be wrinkled, nicked, or otherwise damaged.
- **Temperature:** Envelopes should be compatible with the heat and pressure of the printer.
- **Size:** Envelopes must be within the following size ranges: minimum of 76 by 127 mm (3 by 5 in) and maximum of 216 by 356 mm (8.5 by 14 in).

Note Use only tray 1 to print envelopes. Send envelopes straight through the printer, entering at tray 1 and exiting from the rear output bin

CAUTION Jams might occur when using any media with a length less than 178 mm (7 in). This can be caused by paper that has been affected by environmental conditions. See "Evaluate environmental conditions" in chapter 7.

Envelopes might meet the general specifications listed in table 14 and still not print satisfactorily because of the printing environment or other variables over which HP has no control.

Table 14. Envelope specifications

Description	Specification
Paper	Paper used for envelope construction must meet the paper specifications listed in this manual and the *HP LaserJet Printer Family Print Media Guide* (except for those listed below).
Basis weight	60 to 100 g/m2 (16 to 27 lb), single thickness. Jamming might result if 100 g/m^2 (27 lb) weight is exceeded. See “Moisture-content field test” on page 39
Finish	Avoid using envelopes with adhesive exposed to the printer. Envelopes must be folded accurately so that there are no more than two thicknesses of paper anywhere along the leading edge. All folds must be well scored and sharply creased, and construction must be tight (not baggy). Avoid using envelopes that are stuck together with excess seam gum. See “Furnish (fiber composition) field test” on page 40
Fusing compatibility	All inks, adhesives, and other materials used in the envelope must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See “Fusing-compatibility field test” on page 40
Curl (Pre-printed)	Envelopes must lie flat, with no more than 5 mm (0.2 in) curl across the entire surface. See “Curl field test” on page 40
Caliper	Caliper of 0.084 to 0.14 mm (.0034 in to .0056 in), single thickness. See “Caliper field test” on page 39

Envelopes with adhesive strips or flaps

Envelopes with a peel-off adhesive strip or with more than one flap that folds over to seal must use adhesives compatible with the heat and pressure in the printer. The extra flaps and strips might cause wrinkling, creasing, or jams and can even damage the fuser.

Envelope storage

Proper storage of envelopes contributes to good print quality. Envelopes should be stored flat. If air is trapped in an envelope, creating an air bubble, then the envelope might wrinkle during printing.

Envelopes with double side seams

Double side-seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style might be more likely to wrinkle. Be sure the seam extends all the way to the corner of the envelope as illustrated below.

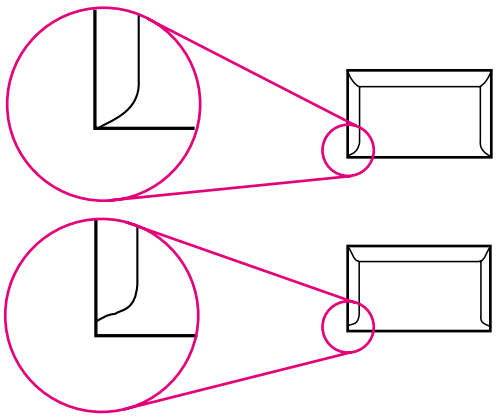

Figure 13. **Double side seam**

Envelope margins

The following gives typical address margins for a commercial #10 or DL envelope.

Table 1. Envelope margins

Type of address	Top margin	Left margin
Return address	15 mm (0.6 in)	15 mm (0.6 in)
Delivery address	51 mm (2 in)	89 mm (3.5 in)

Note For the best print quality, position margins no closer than 15 mm (0.6 in) from the edges of the envelope.

Avoid printing over the area where the envelope seams meet.

Label specifications

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 200 degrees C (392 degrees F), which is the printer's fusing temperature.
- **Arrangement:** Only use labels with no exposed backing between them. Labels can peel off sheets with spaces between the labels, causing jams.
- **Curl:** Prior to printing, labels must lie flat with no more than 13 mm (.5 in) of curl in any direction.
- **Condition:** Do not use labels with wrinkles, bubbles, or other indications of separation.

Note Use only tray 1 to print labels. Send labels straight through the printer, entering at tray 1 and exiting from the rear output bin

CAUTION To avoid damaging the printer, use only labels recommended for laser printers.

Never print on the same sheet of labels more than once or print on a partial sheet of labels.

Table 15. Label specifications

Description	Specification
Adhesive	Must not be on any external surfaces of the label before, during, or after printing. Label construction and die-cutting must not let labels peel off during transport, printing, or fusing.
Caliper	Must not exceed 0.19 mm (0.007 in). See "Caliper field test" on page 39
Curl	In ream: flat within 5 mm (0.2 in). See "Curl field test" on page 40
Surface resistivity	2.0 to 15 by 10 to the 10th ohm square. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 40
Volume resistivity	1.2 to 15 by 10 to the 11th ohm-centimeter. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 40
Finishing precision	Cut sheet within 0.79 mm (0.031 in) of nominal and +0.20 degrees square.
Fusing compatibility	All adhesives, carrier sheets, top sheets, and other materials used in label construction must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See "Furnish (fiber composition) field test" on page 40
Packaging	Store in moisture-proof wrap to preserve properties.
Shelf life	One year, maximum, stored at 22 degrees C (72 degrees F) and 50 percent relative humidity.

Transparency specifications

Transparency construction is critical.

Note Use only tray 1 to print transparencies. Send transparencies straight through the printer, entering at tray 1 and exiting from the rear output bin

CAUTION Transparencies used in the printer must be able to withstand 200 degrees C (392 degrees F), the printer's fusing temperature.

To avoid damaging the printer, use only transparencies recommended for use in laser printers.

Table 16. Transparency specifications

Description	Specification
Surface resistivity	2.0 to 15 by 10 to the 10th ohm square. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 40
Volume resistivity	1.2 to 15 by 10 to the 11th ohm-cm. See "Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers." on page 40
Finishing precision	Cut sheet within 0.79 mm (0.031 in) of nominal and +0.20 degrees square.
Fusing compatibility	Transparency materials must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release hazardous emissions when heated to 200 degrees C (392 degrees F) for 0.1 second. See "Fusing-compatibility field test" on page 40
Caliper	Caliper of 0.100 to 0.110 mm (.0039 to .0043 in). See "Caliper field test" on page 39

Storing print media

Ideally, the printing and media storage environment should be at or near room temperature, and not too dry or too humid. Remember that paper is hygroscopic; it absorbs and loses moisture rapidly.

Heat works with humidity to damage paper. Heat causes the moisture in paper to evaporate, while cold causes it to condense on the sheets. Heating systems and air conditioners remove most of the humidity from a room. As a paper package is opened and used, it loses moisture, causing streaks and smudging. Humid weather or water coolers can cause the humidity to increase in a room. As paper is opened and used it absorbs any excess moisture, causing light print and dropouts. Also, as paper loses and gains moisture it can distort. This can cause jams.

As a result, paper storage and handling are as important as the paper-making process itself. Paper storage environmental conditions directly affect the feed operation.

Users should not purchase more paper than can be easily used in a short time (about three months). Paper stored for long periods might experience heat and moisture extremes, which can cause damage. Planning is important to prevent damage to a large supply of paper.

Unopened paper in sealed reams can remain stable for several months before use. Opened packages of paper have more potential for environmental damage, especially if they are not wrapped with a moisture-proof barrier.

The paper storage environment should be properly maintained to ensure optimum printer performance. The required condition is 20 degrees to 24 degrees C (68 degrees to 75 degrees F), with a relative humidity of 45 percent to 55 percent. The following guidelines should be helpful when evaluating the papers storage environment:

- Paper should be stored at or near room temperature.
- The air should not be too dry or too humid (because of the hygroscopic properties of paper).
- The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the printer environment is subject to extremes, unwrap only the amount of paper to be used during the day's operation to prevent unwanted moisture changes.

Shipping print media

When shipping print media through different environments, plastic-wrap all cartons on the shipping pallet. When shipping media across bodies of water, wrap individual cartons as well. Packaging must protect the media from physical damage.

Paper fillers

Additional chemicals and fillers are frequently added to paper during the manufacturing process. These can affect the paper strength, pick resistance, printability, bulk, feel, and color.

An emulsion containing wax, rosin, starch, or other non-water soluble materials is added to the paper pulp to help control penetration by water and other liquids. Dyes are added and the paper might be bleached. Bleaching is a multistep process using such chemicals as hydrogen peroxide and chlorine dioxide. This transforms the paper from its original brownish state to the desired color.

Finely ground fillers, such as clay, talc, and calcium carbonate, might be added to even out the “peaks and valleys” that occur in the paper mixture, and serve as brighteners. Over time, these fillers can build up on internal assemblies of the printer such as rollers or the toner cartridge. This buildup can eventually cause jams and print defects. To minimize this risk, periodically clean the printer according to procedures. See "Cleaning the printer and accessories" in chapter 4.

Testing media specifications

The following tests describe ways to qualify the media with respect to the specifications listed in this manual and the *HP LaserJet Printer Family Print Media Guide.* See “Tools and suppliers” on page 41 for help obtaining tools needed to perform these tests.

Basis-weight field test

The basis weight should be indicated on the ream label. If the label is not available, a simple field test can identify the basis weight of paper. The basis weight of paper is equal to the weight of 2000 sheets of paper, or four full reams. Weigh a full ream on a postal scale and then multiply that weight by four. Or, weigh 10 sheets of paper, divide that weight by 10, multiply by 2000, and then divide by 16.

Table 17. Determining basis weight of paper

Amount	Formula
4 reams	weight = basis weight
1 ream	weight x 4 = basis weight
10 sheets	(weight divided by 10) x 2000 and then divided by 16 = basis weight

Note Example:

10 sheets weigh 1.6 ounces

0.16 ounce x 2000 = 320 ounces

320 ounce ÷ 16 ounce/lb = 20lb paper

Paper weight equivalence table

Use this table to determine approximate equivalent points in weight specifications other than U.S. bond weight. For example, to determine the equivalent of 20 lb U.S. bond-weight paper in U.S. cover-weight paper, locate the bond weight (in row 3, second column) and scan across the row to the cover weight (in the fourth column). The equivalent is 28 lb media. Shaded areas indicate a standard weight for that grade.

Table 18. Paper weight equivalence

	U.S. post-card thick-ness (mm)	U.S. bond weight (lb)	U.S. text/ book weight (lb)	U.S. cover weight (lb)	U.S. bristol weight (lb)	U.S. index weight (lb)	U.S. tag weight (lb)	Europe metric weight (g/ m2)	Japan metric weight (g/ m2)
1		16	41	22	27	33	37	60	60
2		17	43	24	29	35	39	64	64
3		20	50	28	34	42	46	75	75
4		21	54	30	36	44	49	80	80
5		22	56	31	38	46	51	81	81
6		24	60	33	41	50	55	90	90
7		27	68	37	45	55	61	100	100
8		28	70	39	49	58	65	105	105
9		32	80	44	55	67	74	120	120
10		34	86	47	58	71	79	128	128
11		36	90	50	62	75	83	135	135
12	.18	39	100	55	67	82	91	148	148
13	.19	42	107	58	72	87	97	157	157
14	.20	43	110	60	74	90	100	163	163
15	.23	47	119	65	80	97	108	176	176
16		53	134	74	90	110	122	199	199

Note The U.S. postcard measurements are approximate. Use for reference only.

Metric Sizes

For metric-size paper (A4), use the following method to determine basis weight.

Take 16 sheets of A4 paper and weigh them. One square meter of paper contains approximately 16 A4 size sheets. Compare this weight to the appropriate weight in the “Paper weight equivalence table” on page 2-38.

Caliper field test

The specified caliper differs with the type of media used. See “Operating environment” on page 26

Caliper can be measured in the field using a micrometer.

CAUTION Never use the coarse-adjustment end of the micrometer when measuring for caliper. The coarse adjustment will compress the paper fibers, resulting in an inaccurate reading. For example, if the fibers are compressed, 6 mil paper could measure as little as 3 mils. Always use the fine adjustment to measure caliper.

Using the fine adjustment, slide the micrometer along the edge of the paper and measure at one end. To double-check the accuracy of the reading, always measure again at the opposite end of the paper.

Paper-finish field test

Paper finish, or smoothness, can be accurately measured with a Sheffield meter. If this tool is not available, use a new U.S. dollar bill as a benchmark for comparing paper texture. A dollar bill has a finish of 350 Sheffields, which is 100 over specifications. If paper feels as rough as a dollar bill, it is recommended that users do not continually use this paper in the printer.

Moisture-content field test

Specification: Use paper with 4 percent to 6 percent moisture content.

A ream or sheet of paper can be measured with a moisture meter. In general, only evaluate the customer’s storage environment when trying to determine if excess moisture or dryness is the cause of a problem with paper.

Grain field test

The grain direction is usually specified on the ream label (written out “long” or “short”). The paper dimensions listed on the label also indicate grain direction. For example, short-grain letter-size paper will read “11 by 8.5" and long-grain paper will read “8.5 by 11."

If the grain direction is not included on the ream label, it can be determined by a simple wet test. Cut a small square from the corner of a sheet of paper, wet it, and observe the manner in which it curls.

Envelopes should have a diagonal grain, which gives them the best stability. To determine this, cut a square section from one corner of an envelope. Wet this section and observe the manner in which it curls. Two opposite corners should curl toward each other.

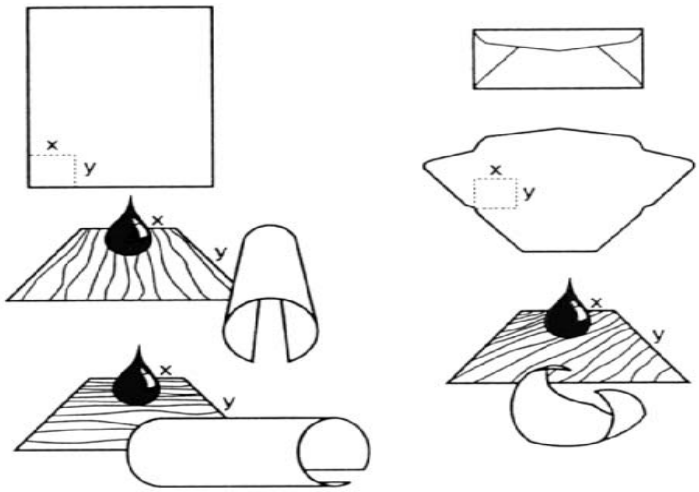

Figure 14. Long, short, and diagonal grain curl

Curl field test

To check for paper curl, place a single sheet of paper onto a flat surface and measure curl at the greatest deflection, holding a ruler perpendicular to the flat surface.

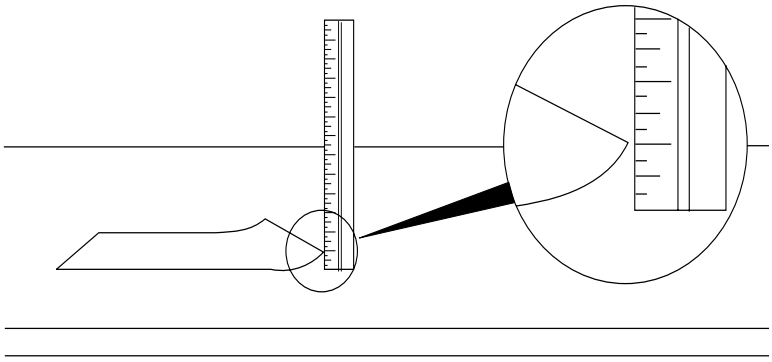

Figure 15. **Measuring curl**

Cut-edge condition field test

The condition of the cut edge can be easily observed with an eye loop. Under magnification, a good edge will appear even. A poorly cut edge will show fraying, jagged edges, compressed fibers, and other damage.

Furnish (fiber composition) field test

Use paper made from 100 percent chemical wood pulp and /or cotton fiber. Recycled paper made with no more than 5 percent groundwood is also acceptable.

Read the ream label to determine the fiber composition of the paper. Paper is usually specified as xerographic bond (suitable for copiers or laser printers) or cotton bond. Cotton bond paper of 25 percent, 50 percent, or 100 percent will be indicated on a watermark. If paper is less than 25 percent cotton bond, the watermark will not indicate a percentage. A wood-pulp test kit can also be used to test fiber composition.

Fusing-compatibility field test

Inspect the rollers for colored ink buildup from preprinted logos or letterhead, and for toner buildup or spots. Inspect printed output for repetitive defects and smearing. If necessary, have users contact the forms vendor to ensure the paper's fusing compatibility with HP LaserJet printers.

Tools and suppliers

Hewlett-Packard neither warrants nor recommends a particular manufacturer, supplier, or tool. Products are subject to change and HP has no control over such changes. However, the following table of tools and their suppliers is provided for convenience.

Table 19. Tools and suppliers

Tool	Part Number	Supplier Address
Paper moisture meter Single-sheet clamp probe	2RRDMP 2R43E	Mitchell Instrument 1570DDD Cheroke St. San Marcos, CA 92069-2433
Temperature/humidity meter	#3T331	Industrial Motor Service 2000 Albright Montgomery, IL 60538
Sheffield tester: precisionaire column Sheffield tester: smoothcheck gauge	TM 58-25-01 TM 58-25-02	TMI Testing Machines Inc. 400 Bayview Avenue Amityville, NY 11701 (516) 842-5400
Wood-pulp test kit pH test kit	4280-2 4360-2	Shape Products 1127 57th Avenue Oakland, CA 94621 (800) 444-0015
Resistivity test tool: precision current/resistance meter Resistivity test tool: surface resistivity probe	 278 96117-1	Monroe Electronics 100 Housel Avenue PO Box 100 Lyndonville, NY 14098 (800) 821-6001

3 Printer configuration

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Control panel

The printer control panel has only two buttons: JOB CANCEL and GO. See figure 16. Pressing one of these buttons or a combination of the two does the following:

- cancels print jobs
- resumes printing when the printer is paused
- prints a demo page or a self test/configuration page
- initiates a continuous self test
- performs a cold reset or a nonvolatile random access memory (NVRAM) initialization
- reveals secondary information (for example, light messages)

Other printer configurations must be performed using printer job language (PJL) commands or the LaserJet configuration utility. See “Service mode” on page 52.

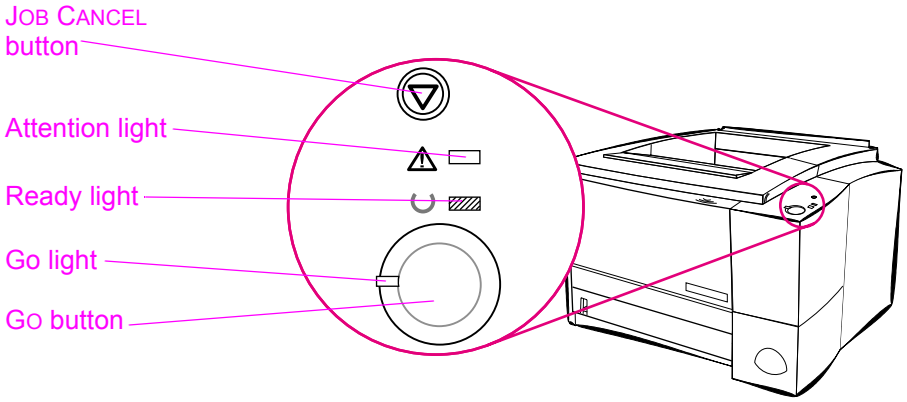


Figure 16. **Control panel layout**

Control panel lights

The control panel lights provide both status and error messages by using distinct light patterns. See "Troubleshooting with control-panel messages" in chapter 7.

Job Cancel

Press JOB CANCEL to cancel a job the printer is currently printing. The control panel lights will cycle while the print job is cleared from both the printer and the computer, and then return to the ready state (Ready light on). This can take some time, depending on the size of the print job.

- If JOB CANCEL is accidentally pushed, the job must be reprinted. There is no undo function.
- If JOB CANCEL is pushed when the printer is idle nothing happens.

Go

- Press GO to resume printing when the printer is paused or when unprinted data is still in the printer.
- Press GO to clear particular printer errors.
- Press GO to print a demo page. The printer must be in the ready state (Ready light on).

To identify and troubleshoot control panel light messages, see "Troubleshooting with control-panel messages" in chapter 7.

Printing a demo page

To print the demo page, press Go when the printer is ready (Ready light is on).

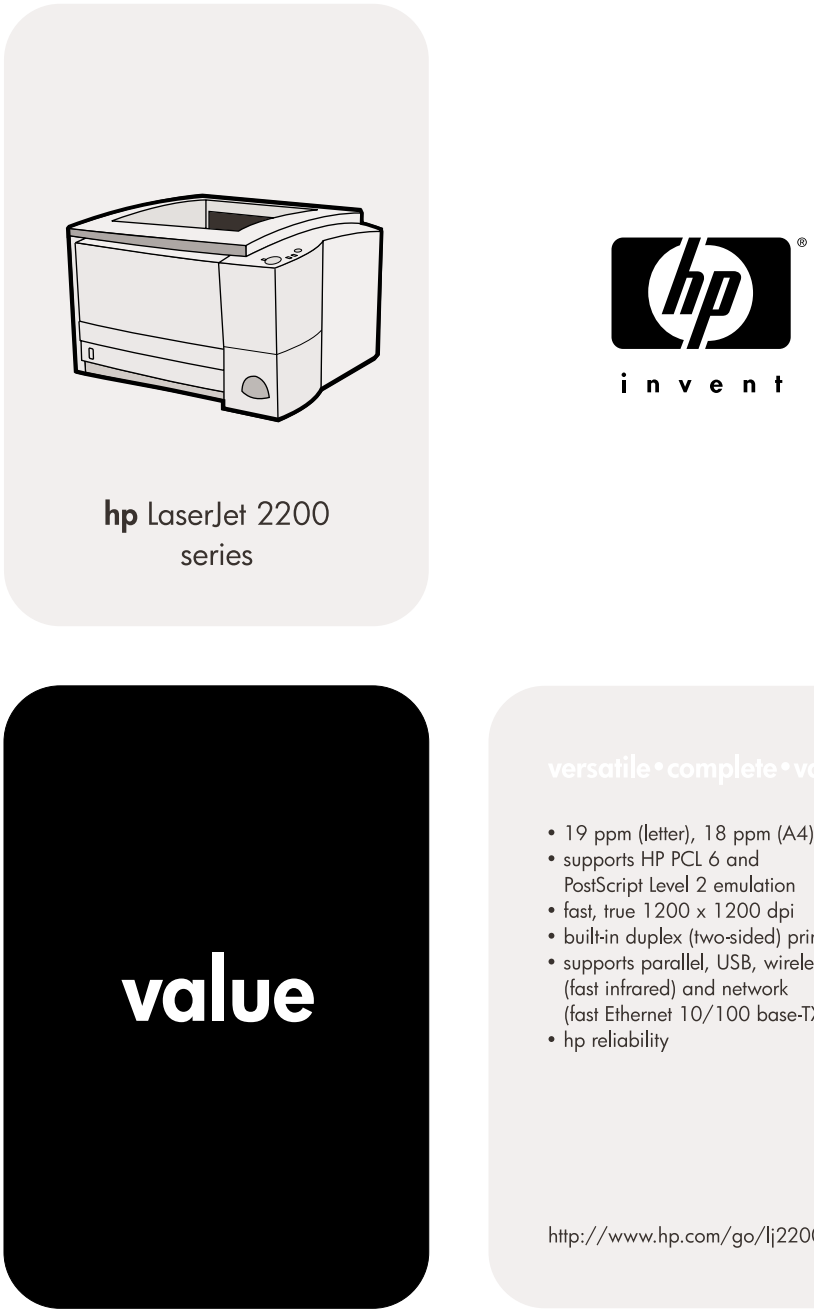

hp LaserJet 2200
series
invent
value
versatile • complete • value
• 19 ppm (letter), 18 ppm (A4)
• supports HP PCL 6 and PostScript Level 2 emulation
• fast, true 1200 x 1200 dpi
• built-in duplex (two-sided) printing
• supports parallel, USB, wireless (fast infrared) and network (fast Ethernet 10/100 base-TX)
• hp reliability
http://www.hp.com/go/lj2200

Figure 17. **Demo page (front)**

Figure 18. **Demo page (back)**

Self test/configuration page

The self test/configuration page lists many of the printer's current settings and properties. To print the self test/configuration page, press and release GO and JOB CANCEL simultaneously when the printer is ready (Ready light is on). If you have an EIO print-server card installed, a second page, the JetDirect Page, will print listing all of the HP JetDirect information.

The demo and self test/configuration pages can also be printed from the HP LaserJet device configuration reports page.

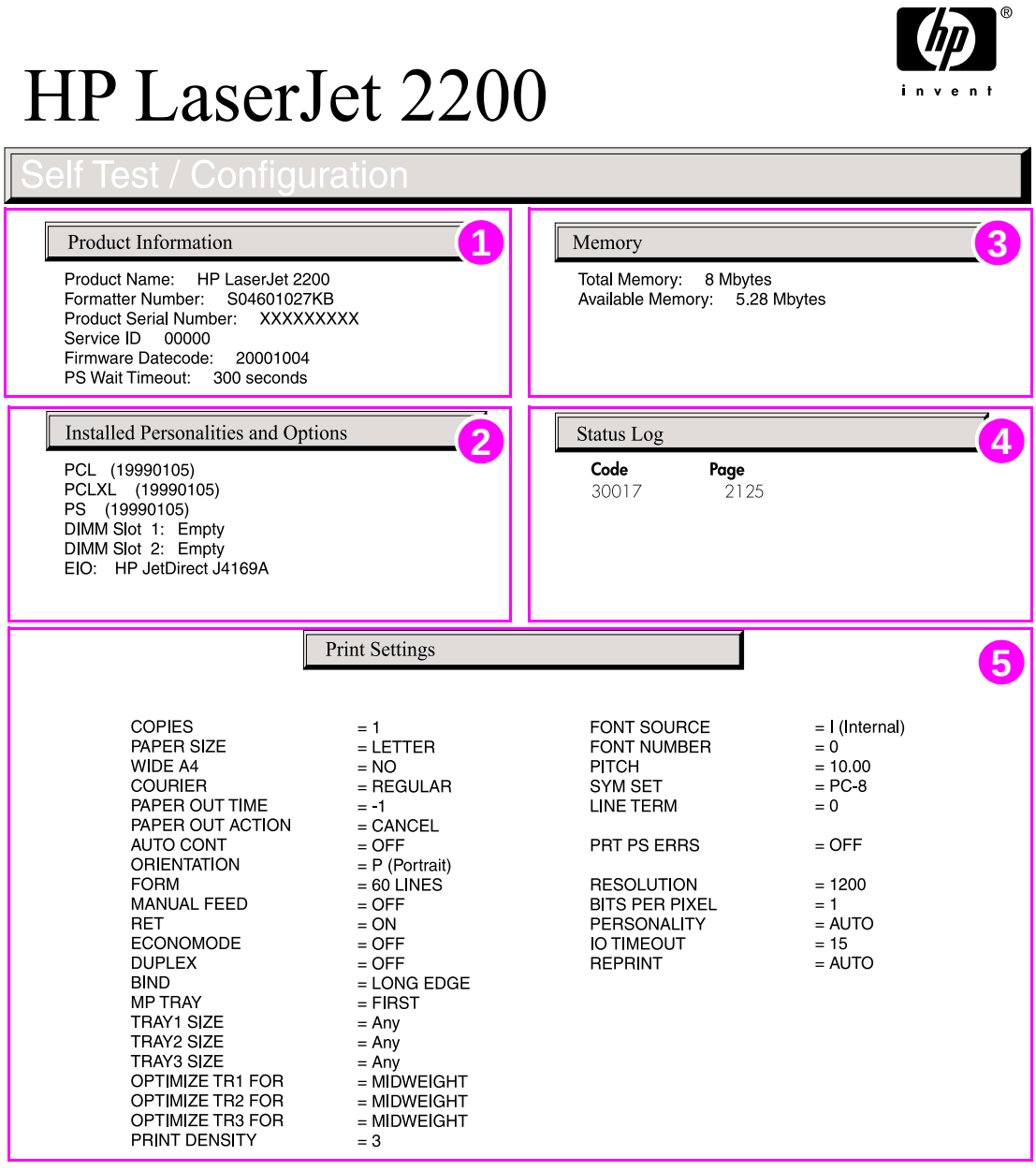


Figure 19. **Self test/configuration page**

Self test/configuration-page elements

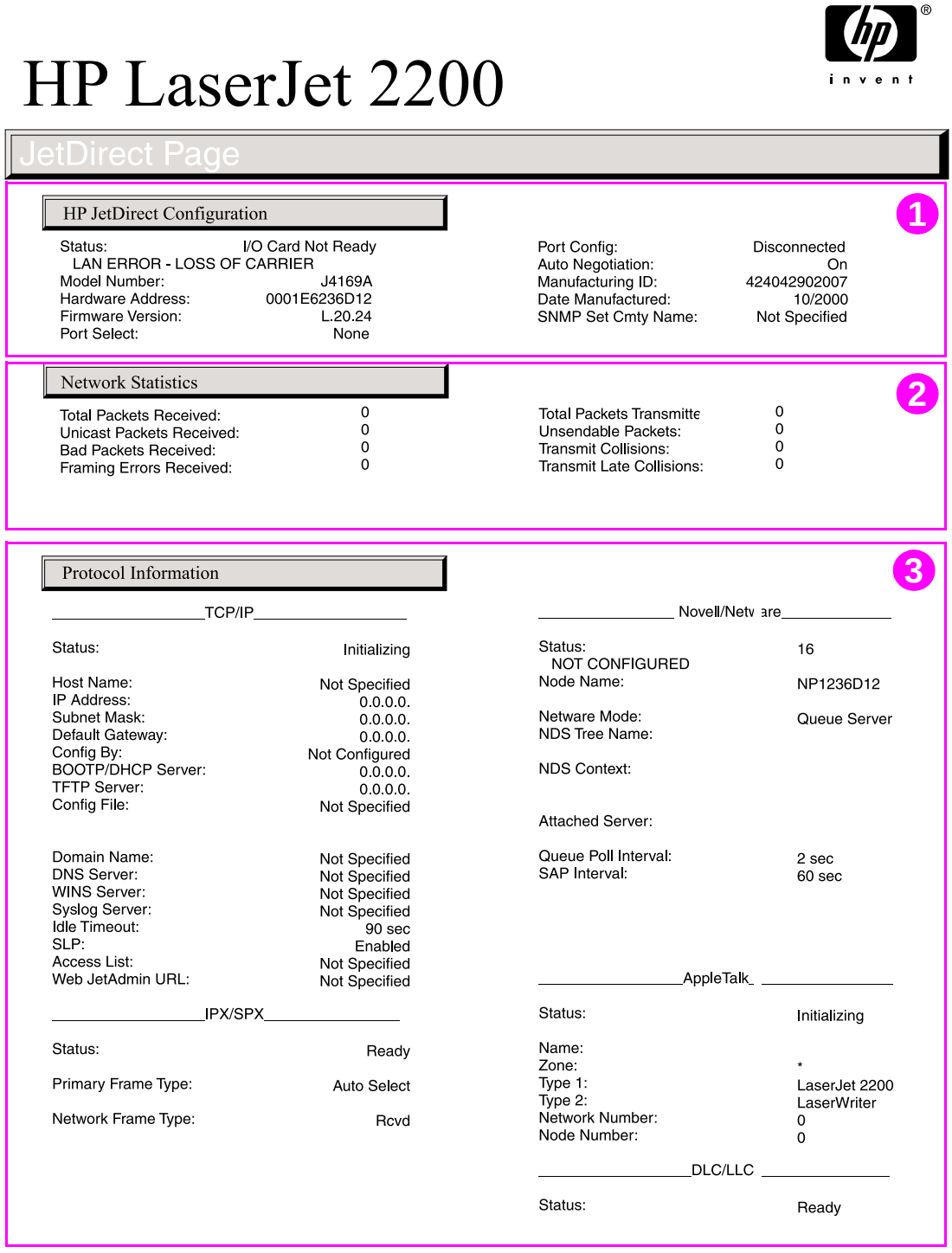
1 **Product information** lists the name, formatter number, serial number, service ID, firmware datecode, total pages printed, duplex page count, pages jammed in printer, pages mispicked in printer, and PS wait timeout.

2 **Installed personalities and options** lists the installed printer languages (PCL, PCL 6, and PS), DIMM slot 1 and 2 information, and the EIO slot information.

3 **Memory** lists total memory and available memory.

4 **Status log** lists the PJL status code and the corresponding page count. (The status log only appears when errors have been registered.)

5 **Print settings** lists settings for copies, paper size, wide A4, courier, paper out time, paper out action, auto continue, orientation, form, manual feed, Resolution Enhancement technology (REt), EconoMode, duplex, bind, MP tray, tray 1 size, tray 2 size, tray 3 size, optimize tray 1 for, optimize tray 2 for, optimize tray 3 for, print density, font source, font number, pitch, symbol set, line term, PS error reporting, resolution, bits per pixel, personality, I/O timeout, and reprint.



HP LaserJet 2200

JetDirect Page

1

HP JetDirect Configuration

Status:	I/O Card Not Ready	Port Config:	Disconnected
LAN ERROR - LOSS OF CARRIER		Auto Negotiation:	On
Model Number:	J4169A	Manufacturing ID:	424042902007
Hardware Address:	0001E6236D12	Date Manufactured:	10/2000
Firmware Version:	L.20.24	SNMP Set Cmty Name:	Not Specified
Port Select:	None		

2

Network Statistics

Total Packets Received:	0	Total Packets Transmitte	0
Unicast Packets Received:	0	Unsendable Packets:	0
Bad Packets Received:	0	Transmit Collisions:	0
Framing Errors Received:	0	Transmit Late Collisions:	0

3

Protocol Information

TCP/IP

Status:	Initializing
Host Name:	Not Specified
IP Address:	0.0.0.0.
Subnet Mask:	0.0.0.0.
Default Gateway:	0.0.0.0.
Config By:	Not Configured
BOOTP/DHCP Server:	0.0.0.0.
TFTP Server:	0.0.0.0.
Config File:	Not Specified
Domain Name:	Not Specified
DNS Server:	Not Specified
WINS Server:	Not Specified
Syslog Server:	Not Specified
Idle Timeout:	90 sec
SLP:	Enabled
Access List:	Not Specified
Web JetAdmin URL:	Not Specified

IPX/SPX

Status:	Ready
Primary Frame Type:	Auto Select
Network Frame Type:	Rcvd

Novell/Netv are

Status:	16
NOT CONFIGURED	
Node Name:	NP1236D12
Netware Mode:	Queue Server
NDS Tree Name:	
NDS Context:	
Attached Server:	
Queue Poll Interval:	2 sec
SAP Interval:	60 sec

AppleTalk

Status:	Initializing
Name:	
Zone:	*
Type 1:	LaserJet 2200
Type 2:	LaserWriter
Network Number:	0
Node Number:	0

DLC/LLC

Status:	Ready

Figure 20. **JetDirect configuration page**

JetDirect configuration-page elements

1. **General information** lists the HP JetDirect number, firmware revision, LAN hardware address, selected port, manufacturing ID, I/O card status, and network statistics (unicast packets, total packets, bad packets, framing errors received, packets transmitted, unsendable packets, transmit collisions, and transmit late collisions).
2. Network statistics lists total packets received, unicast packets received, bad packets received, framing errors received, total packets received, unsendable packets, transmit collisions, transmit late collisions.
3. **Protocol information** lists TCP/IP status and configuration, the HP Web JetAdmin server name, Novell NetWare status and configuration, AppleTalk status and configuration, and DLC/LLC status.

Continuous self test

To initiate a continuous self test:

- Turn the printer power off.
- Press and hold GO.
- Turn the printer power back on and continue to hold GO until the Attention and Ready light turn on.
- Release GO.
- The Ready light blinks indicating the device is in continuous self test mode.
- The printer prints self test/configuration pages until JOB CANCEL is pressed.

Performing an engine test

The engine test can be used to verify that the print engine is functioning correctly. The formatter PCB is completely bypassed during an engine test; therefore, this test is useful for isolating problems. Because the engine test prints a full page of horizontal lines across the entire printable area, it is also useful for checking registration.

To print an engine-test page, insert paper into tray 1 or tray 2, remove the EIO cover, and use a long, nonconductive object to press the engine-test button (callout 1) shown in figure 21. A single page prints.

Note The duplexer test will pull paper from tray 2, but paper must be present in tray 1.

To perform a duplexer test, insert paper into tray 1 and tray 2, remove the EIO cover, and use a long, nonconductive object to press the engine-test button shown in figure 21. A duplexed page prints.

WARNING! Do not use an electrically conductive object to press the engine-test button.

Do not insert any object into the opening next to the power cord socket. This is not the engine-test button.

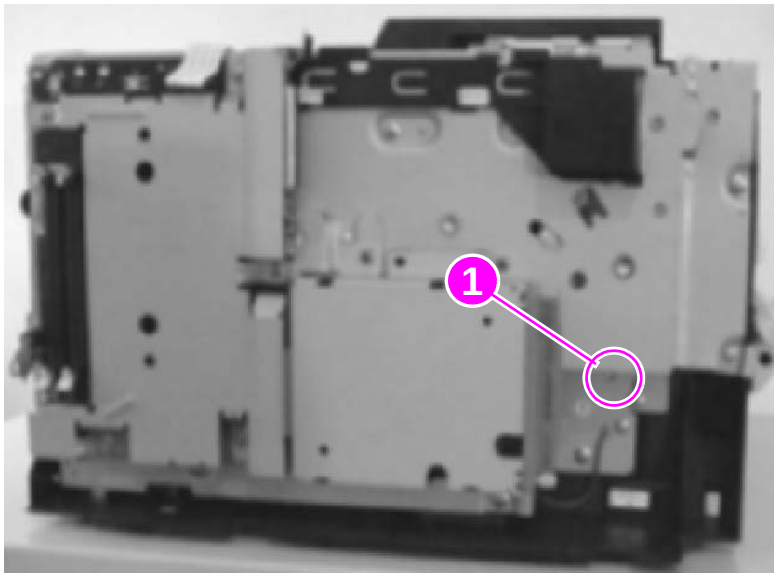


Figure 21. Engine-test button

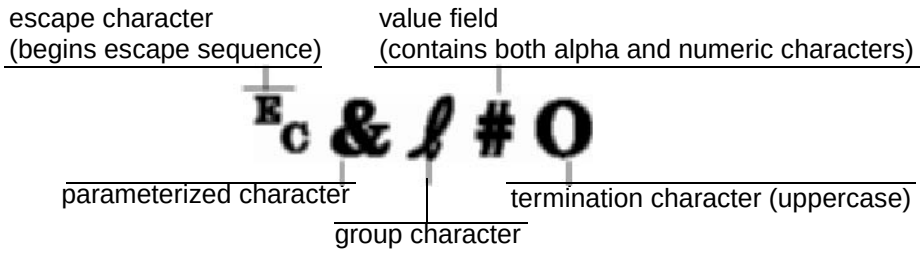
Service mode

In service mode the following can be performed:

- Print a service mode self test.
- Verify and set the page count. See “Setting the page count” on page 53.
- Set the cold reset default. See “Setting the cold reset default” on page 54.
- Set the demo page = true/false (used to remove the demo page from the service mode self test).
- Set the diagnostic functions on or off (for software developers’ use only).

Entering service mode

Use PJL commands to enter service mode and perform various service-mode configurations. See table 21. Users must use the exact character and case specified for PCL printer commands. The following are elements of a typical printer command:



- escape character (begins escape sequence)
- parameterized character
- group character
- value field (contains both alpha and numeric characters)
- termination character (uppercase)

Escape sequences can be combined into one escape sequence string. There are three important rules to follow when combining code:

1. The first two characters after the escape character (the parameterized and group characters) must be the same in all of the commands to be combined.
2. When combining escape sequences, change the uppercase (termination) character in each individual escape sequence to lowercase.
3. The final character of the combined escape sequence must be uppercase.

Entering escape characters

Printer commands always begin with the escape character (E_C). The following table shows how the escape character can be entered from various DOS software applications

Table 20. Escape character table

DOS software	Application entry	What appears
Lotus 1-2-3	Type \027	027
Word Perfect for DOS	Type<27>	<27>
MS-DOS Edit	Hold down Ctrl-P, and press Esc	<--
MS-DOS Edlin	Hold down Ctrl-V, release, then press [	^[

Table 21 shows how to use PJL commands to enter service mode and perform various service mode configurations.

Table 21. PJL service mode commands

PJL Command	Description
E_C%-12345X@PJL	Start PJL job
@PJL SET SERVICEMODE=HPBOISEID	Enter service mode
@PJL SET PAGES=0	Set page count [= xxxxx]
@PJL SET SERIALNUMBER=USBBB12345	Set printer serial number (=chassis label serial number)
@PJL SET CRPAPER=LETTER	Set cold-reset page size [=letter/A4]
@PJL SET SKIPDEMO=FALSE	Skip demo/PCL type page [=true/false]
@PJL SET DIAGNOSTICS=OFF	Set diagnostics [=OFF/ON] (for ISV use)
@PJL SET SERVICEMODE=EXIT	Exit service mode
DEFAULT PAPER=LETTER	Select user paper-size default
@PJL RESET	Perform PJL reset
E_C%-12345X	Exit PJL mode
E_CZ	Print self test/configuration page
E_CE	Reset the printer

Setting the page count

The page count is stored in the printer's NVRAM. If it is necessary to replace the formatter PCB, the page count should be reset to the printer's original page count to reflect the age of the print engine. Before removing the old formatter PCB, print a self test/configuration page to verify the current page count of the printer, if possible. See "Self test/configuration page" on page 47.

Table 22. Setting the page count

PJL Command	Description
E_C%-12345X@PJL	Start PJL job
@PJL SET SERVICEMODE=HPBOISEID	Enter service mode
@PJL SET PAGES=0	Set page count [= xxxxx]
@PJL SET SERVICEMODE=EXIT	Exit service mode
@PJL RESET	Perform PJL reset
E_C%-12345X	Exit PJL mode
E_CZ	Print self test/configuration page
E_CE	Reset the printer

Setting the cold reset default

The customization variable will determine the default paper size after a cold reset. This is set to A4/letter at the manufacturer. This variable might need to be reset when the formatter is replaced.

Table 23. Setting the cold reset default

PJL Command	Description
E_C%-12345X@PJL	Start PJL job
@PJL SET SERVICEMODE=HPBOISEID	Enter service mode
@PJL SET CRPAPER=LETTER	Set cold-reset page size [=Letter/A4]
@PJL SET SERVICEMODE=EXIT	Exit service mode
@PJL RESET	Perform PJL reset
E_C%-12345X	Exit PJL mode
E_CZ	Print self test/configuration page
E_CE	Reset the printer

Resetting the printer

Cold reset

Note This feature will set all system parameters to the factory defaults.

To perform a cold reset:

- Turn the printer power off.
- Press and hold Go.
- Turn the printer power back on and continue to hold Go until the Attention light turns on.
- Release Go.
- The device lights will begin cycling from front to rear. The cold-reset process will run until completion and the device will go to the ready state.

NVRAM initialization

This feature will reinitialize NVRAM and set all system parameters to the factory defaults. During the NVRAM initilization process, all button presses will be ignored.

To perform a NVRAM initialization:

- Turn the printer power off.
- Press and hold Go.
- Turn the printer power back on and continue to hold Go until the Attention, Ready, and Go lights turn on.
- Release Go.
- The device lights will begin cycling from font to rear. The NVRAM initilization will run until completion and the device will go to the ready state.

EIO card reset

To perform a EIO card reset:

- Turn the printer power off.
- Press and hold Go.
- Turn the printer power back on and continue to hold Go until the Attention light turns on.
- Release Go.
- The device lights will begin cycling from front to rear. The cold-reset process will run until completion and the device will go to the ready state.

Installing an HP JetDirect EIO card

Step 1 Turn the printer off, and disconnect the power cord.

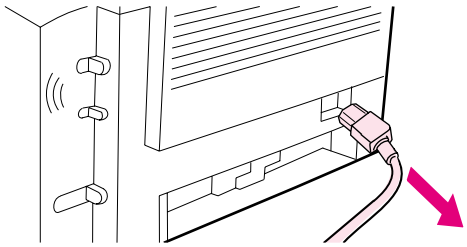


Figure 22. **Power cord.**

Step 2 Open the interface cable door by pressing on the release tabs. Disconnect all interface cables.

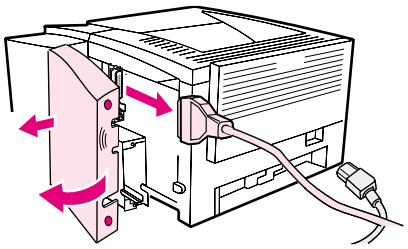


Figure 23. **Interface cables.**

Step 3 Locate the EIO slot. Firmly insert the HP JetDirect EIO card into the EIO slot. Install the retaining screws.

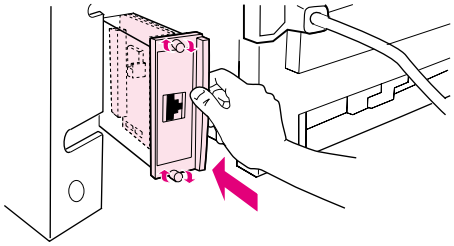


Figure 24. **HP JetDirect EIO card.**

Step 4 Attach the appropriate network cable to the EIO card.

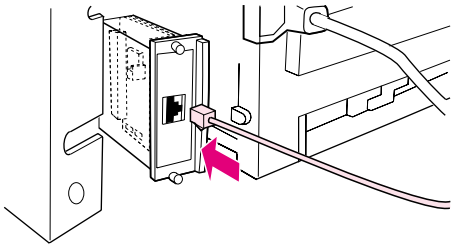


Figure 25. **Network cable.**

Step 5 Reinstall the interface cable(s), close the interface cable door, reinstall power cord, and turn the printer on.

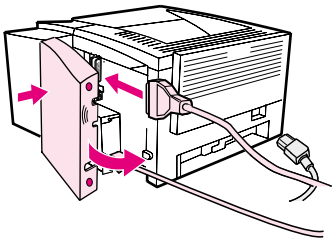


Figure 26. **Interface cable door.**

Note Print a self test/configuration page to verify that the HP JetDirect EIO card appears as an installed option.

Fast Infrared Receiver

The fast infrared receiver (FIR) port is located on the lower right corner of the printer. This port is compliant with the specifications determined by the Infrared Data Association (IrDA). On the right side of the FIR port is a status light that indicates when the port is active. The FIR port transmits data at speeds of up to 4 MB per second. When the infrared (IR) connection is established, the FIR status light comes on. If the connection is broken, or when the print job is complete, the FIR status light goes off.

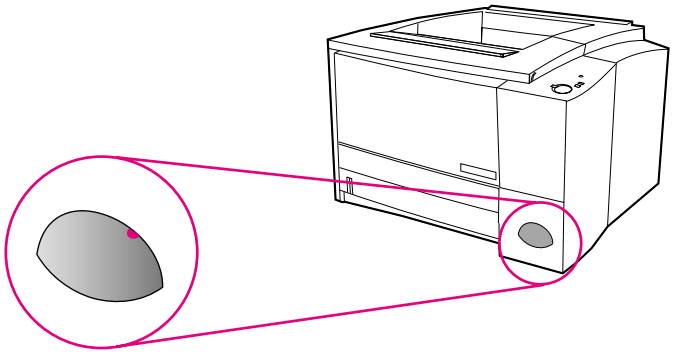


Figure 27. **FIR port**

Using the FIR port

To use the FIR port, you need the following:

- A computer or personal digital assistant (PDA) equipped with an IrDA-compliant IR port.
- An infrared port driver that allows printing from the computer to the printer using the FIR port and the IrDA communication protocol.
- A computer with a printer driver installed to generate data that the printer can print.

Note Check with your computer hardware or operating system manufacturer for the correct port driver.

To operate the FIR port, you need to meet the following conditions:

- A portable computer (or other portable device equipped with an IrDA-compliant IR window) aligned within 1 meter (2 to 3 feet maximum) of the HP Fast InfraRed Receiver.
- The IR window must be at an angle of +/- 15 degrees to ensure an effective connection for printing.

4 Printer maintenance

Chapter contents

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Service check points

Periodic replacement parts are the parts that should be inspected and if required, replaced at regular intervals. Failure of these parts can seriously affect the printer's performance. These parts should be inspected during a regular service visit near the end of the part's expected life and replaced if found to be worn or damaged.

Periodic inspection of parts

The following parts should be inspected and, if required, replaced after approximately 150,000 pages of use:

- fuser assembly
- transfer roller
- separation pads (tray 1, tray 2, and tray 3)
- pickup rollers (tray 1, tray 2, and tray 3)
- output feed rollers (upper and lower)
- transport belts and rollers

See "Removal and replacement" in chapter 6 for procedures to remove and replace these parts.

See "Parts and diagrams" in chapter 8 for the part numbers.

Variables such as media, environment, and usage can cause premature wear of these parts. See "Media specifications" in chapter 2 for information about suitable media, environment, and usage conditions.

Cleaning the printer and accessories

To maintain superior print quality and performance, use the following procedures to clean the printer and the paper-handling accessories thoroughly every time you change the toner cartridge or whenever print-quality problems occur.

General cleaning

WARNING! Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

CAUTION Do not use ammonia-based cleaners on or around the printer. While cleaning the printer, be careful not to touch the transfer roller (located underneath the toner cartridge). Skin oils on the roller can cause print-quality problems.

To prevent damage, do not expose the toner cartridge to light. Place a piece of paper over the top of the toner cartridge to shield it while it is out of the printer.

- Clean the outside of the printer with a water-dampened cloth.
- Clean the inside of the printer with a dry, lint-free cloth:
  - transfer roller
  - tray 1, tray 2, and tray 3 pickup roller
  - tray 1, tray 2, and tray 3 separation pad
  - registration shutter
  - transfer guide unit
  - feed belt/feed guide unit
  - fusing assembly entrance guide

Cleaning spilled toner

Defective toner cartridges can develop leaks. After a jam has occurred, some toner might remain on the rollers and guides inside the printer. The pages that print immediately after the jam can pick up this toner.

Note To clean skin and clothing if toner spills, remove as much toner as possible with dry tissue, then wash with cold water. Hot water causes toner to permanently set into clothing.

Vacuum specifications

Do not vacuum the printer or any spilled toner using a conventional vacuum. Toner particles used in this product might be too fine for effective vacuuming and could result in damage to conventional vacuums.

A vacuum specifically designed for cleaning toner can be used if it is capable of filtering fine particles (5 microns in diameter).

Internal cleaning

During the printing process, paper, toner, and dust particles can accumulate inside the printer. Over time, this buildup can cause print quality problems such as toner specks or smearing. This printer has an internal cleaning mode that can correct and prevent these types of problems.

WARNING! Before you begin these steps, turn the printer off and unplug all power cords to avoid shock hazard.

Step 1 Open the top cover.

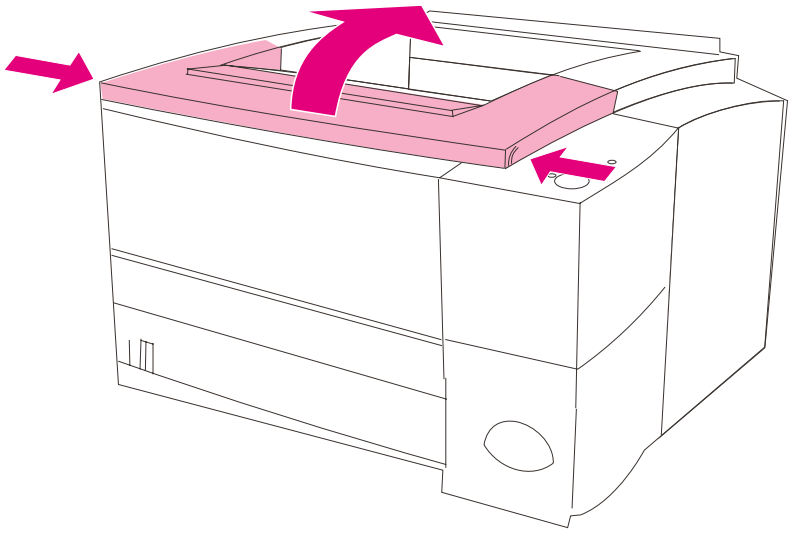

Figure 28. **Top cover**

Step 2 Remove the toner cartridge.

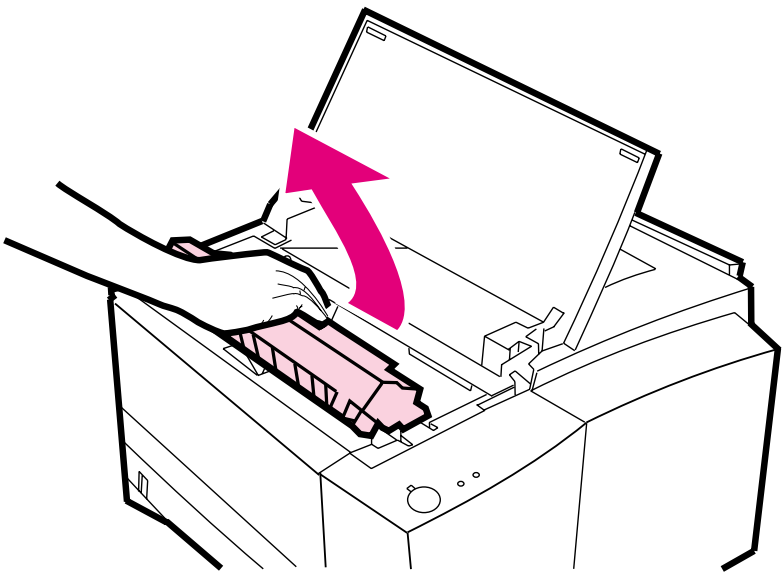

Figure 29. **Remove toner cartridge**

CAUTION To prevent damage, do not expose the toner cartridge to light.

Step 3 With a dry, lint-free cloth, wipe any residue from the paper-path area and the toner cartridge cavity.

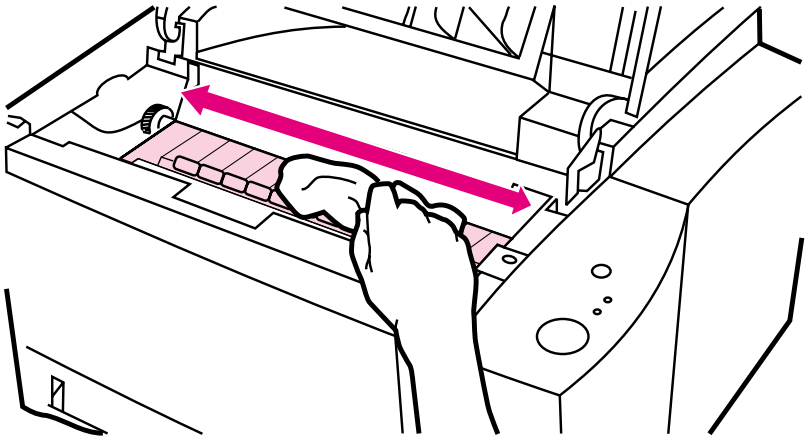

Figure 30. Wipe residue

Step 4 Replace the toner cartridge and close the top cover. Plug in the power cable, and turn the printer on.

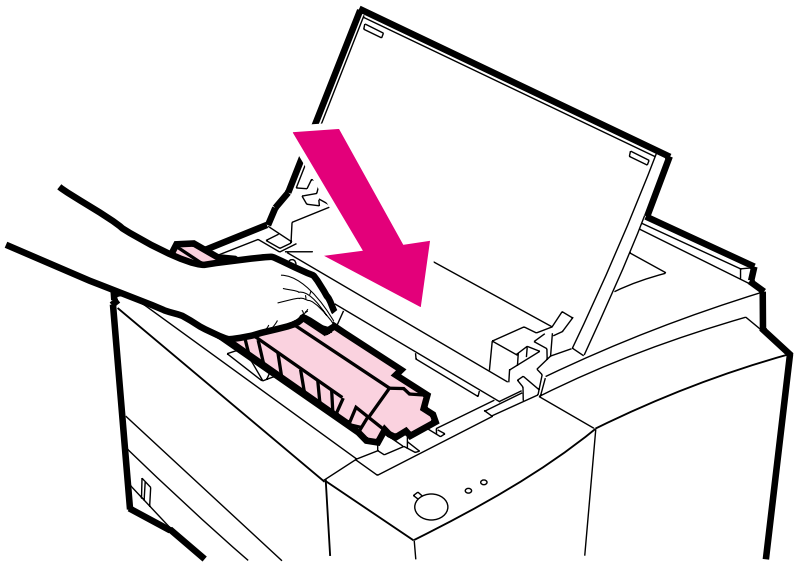

Figure 31. Replace toner cartridge

Engine cleaning

Note For best results, use a transparency during this process. If a transparency is not available, use copier-grade paper; do not use bond or rough paper.

This process uses a transparency from tray 1 to remove dust and toner from the paper path. Use this process if toner specks or dots appear on printouts. This process will produce a blank page which should be discarded.

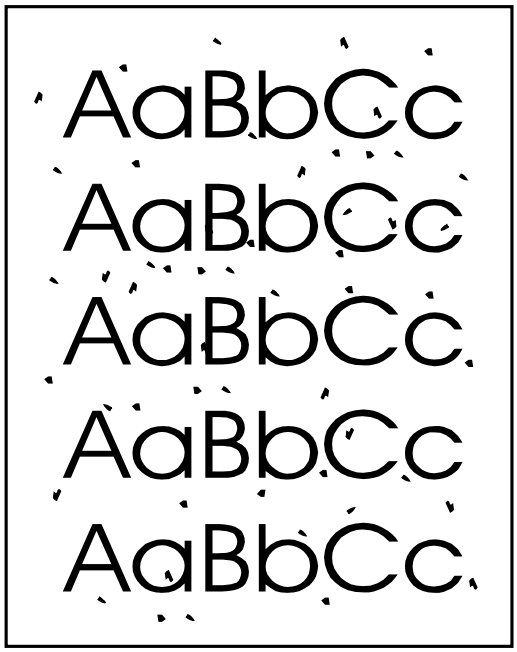

Figure 32. **Print sample**

Note During the engine cleaning process, the printer pulls the transparency into the printer and then stops. This is not a jam. The transparency will be slowly stepped through the printer to complete the engine cleaning.

To start engine cleaning

Step 1 Make sure the printer is turned on and in the ready state. Load a transparency in tray 1.

Step 2 Press and hold 10 seconds.

Step 3 Release Go, the lights will cycle from front to back until the cleaning process has completed.

Note If Go is not held long enough the device will print a demo page rather than performing the cleaning process.

Step 4 Discard the blank page produced from the engine cleaning process.

Toner cartridge information

Toner cartridges contain components that are sensitive to light, temperature, and humidity. Make sure the user follows the recommendations in this section to ensure the highest quality and longest life of the toner cartridge.

Storage

The toner cartridge (C4096A) should not be removed from its package until installation. The shelf life of a cartridge in an unopened package is approximately 2.5 years. The shelf life of a cartridge in an opened package is approximately 6 months. The expiration date of the toner cartridge is stamped on the cartridge box.

If cartridges are stored, the storage environment should meet the conditions listed in the following table:

Table 24. Storing toner cartridges

Category	Temperature	Humidity
Operating	10 degrees to 32.5 degrees C (50 degrees to 90.5 degrees F)	35 percent to 85 percent RH
Storage	-20 degrees to 40 degrees C (-4 degrees to 104 degrees F)	15 percent to 90 percent RH

If the toner cartridge must be removed from the printer, always store the cartridge:

- inside the protective bag in which it was originally packaged.
- in a dark cabinet, away from direct sunlight.
- correct side up and in a horizontal position (not standing on end).
- in a temperature listed in the table above.
- away from ammonia or other organic solvent fumes.

CAUTION Never ship the printer with a toner cartridge installed. Excessive vibration during shipping can cause toner to leak, contaminating the printer.

Never expose the toner cartridge to direct sunlight, or to room light. Bright light and direct sunlight can permanently damage a toner cartridge.

Handling instructions

- Before installing a cartridge, evenly distribute the toner. See “Redistributing the toner” on page 67.
- Do not touch the surface of the photosensitive drum in the cartridge. Protect the drum from light and contamination.
- Do not expose the cartridge to unnecessary vibrations or shock.
- Do not expose the photosensitive drum to strong light. Blurred areas on the page might indicate that the drum has been exposed to light for too long. This causes permanent damage to the photosensitive drum. Replace the cartridge.
- Never manually rotate the drum, especially in the reverse direction; it can cause internal damage and toner spills.

Refilled toner cartridges

HP policy on non-HP toner cartridges

Hewlett-Packard Company cannot recommend use of new, refilled, or remanufactured, non-HP toner cartridges. Because they are not HP products, HP cannot influence their design or control their quality.

While Hewlett-Packard Company does not prohibit the use of refilled toner cartridges during the warranty period or while under a maintenance contract, we do not recommend their use for the following reasons:

- Hewlett-Packard has no ability to ensure that a refilled toner cartridge functions at the high level or reliability of a new HP toner cartridge. Hewlett-Packard also cannot predict the long-term effect of the different toner formulations found in refilled cartridges.
- Hewlett-Packard has no control over the print quality of a refilled toner cartridge. The print quality of HP toner cartridges influences the customer's perception of the printer.
- Repairs resulting from the use of refilled toner cartridges might not be covered under the HP warranty or maintenance contract.

Recycling toner cartridges

In many countries, this product's printing supplies (for example, toner cartridge) can be returned to HP through the HP Printing Supplies Environmental Program. An easy-to-use take back component of the program is available in more than 20 countries. Multilingual program information and instructions are included in every new HP LaserJet toner cartridge and consumables box.

For more information, call (1) (800) 340-2445 (U.S. only) or visit the HP LaserJet supplies website:

U.S.: http://www.hp.com/ljsupplies/environment_main.html

Europe: http://www.hp.com/pays/eur_supplies/english/planetpartners

Customers outside the United States should call their local HP sales and service office for further information regarding availability of the HP Printing Supplies Environmental Program.

Toner cartridge weights

The approximate weight of a toner cartridge when full and empty is as follows:

- Full: 1105 grams (39.07 ounce)
- Empty: 900 grams (31.77 ounce)

Toner cartridge life expectancy

The life of the toner cartridge depends on the amount of toner used in each print job. When printing text at 5 percent coverage, an HP LaserJet 2200 toner cartridge lasts an average of 5,000 pages. This assumes the default print density setting and that EconoMode is off (default settings).

Saving toner with EconoMode

Toner cartridge usage can be extended by using the printer's EconoMode feature. EconoMode can be turned on or off through the driver or HP LaserJet device configuration.

- EconoMode functions in portrait orientation only.
- EconoMode does not function at 1200 dpi.
- Some software applications might refer to EconoMode as "draft mode."

Redistributing the toner

When toner is low, faded or light areas might appear on a printed page. To temporarily improve print quality, redistribute the toner. The cartridge will need to be replaced soon. Use the following procedures to redistribute toner.

WARNING! Avoid reaching too far into the printer. The adjacent fusing area can be hot.

CAUTION To prevent damage, do not expose the toner cartridge to light.

Step 1 Remove the toner cartridge from the printer.

Step 2 Rotate the toner cartridge and gently shake from side to side to redistribute the toner. (Do not tip the cartridge on end, or it might leak.)

If toner gets on clothing, wipe it off with a dry cloth and wash clothing in cold water. (Hot water sets toner into fabric.)

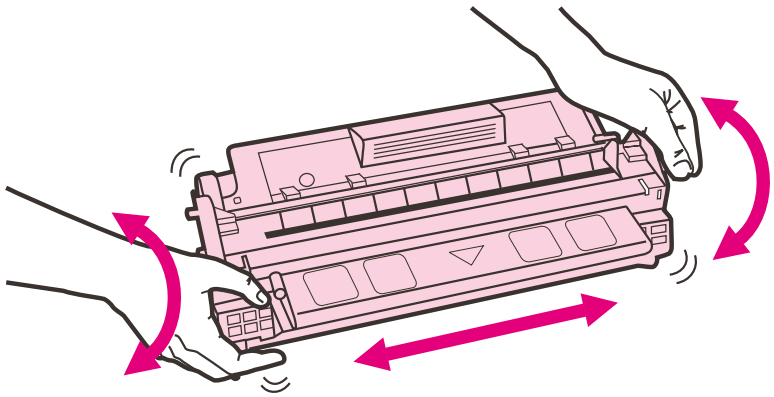

Figure 33. Redistributing the toner

5 Theory of operation

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Power-on sequence

The sequence from power-on until the printer enters the standby (STBY) mode:

1. Power-on.
2. CPU initialization.
3. Formatter communication start.
4. Fusing heater drive.
5. Main motor, Reverse motor, and fan drive—Reads the paper-detecting status of each sensor in the printer immediately before driving the main motor, and assesses a jam if residual media is detected.
6. High-voltage control—Detects the cartridge presence and cleans the transfer charging roller after the primary charging ac bias is turned on.
7. Residual paper check—After starting the main motor, detection of residual media in the printer resumes. If residual media is detected, the printer assesses a jam or automatically delivers the residual media, according to the situation.
8. Failure or abnormality check—Detects door-open, fan-motor, and fuser-unit failures during the other sequence periods.

Basic print-period operating sequences

The operation sequences of this printer are controlled by the microprocessor (CPU) on the engine controller printed circuit board (PCB). The table below describes the purpose of periods from power-on until the main motor stops when printing is complete.

Table 25. Print period descriptions

Period	Timing	Purpose	Remarks
WAIT (wait period)	From power-on until completion of the main-motor initial drive.	Clears the drum surface potential and cleans the transfer charging roller.	Detects whether the cartridge is installed or not.
STBY (standby period)	From the end of the WAIT period until the print instruction command is received from the formatter, or from the end of the LSTR period until the print instruction command is input from the formatter, or until the power is switched on or off.	Maintains the printer in a ready state.	
INTR (initial rotation period)	From receipt of the print instruction command from the formatter until the media reaches the top-of-page sensor.	Stabilizes the sensitivity of the photosensitive drum in preparation for printing.	
PRINT (print period)	From the end of the INTR period until 1.2 seconds after the top-of-page sensor detects the trailing edge of the media.	Forms an image on the photosensitive drum in preparation for printing.	
LSTR (last rotation period)	From completion of printing until the main motor stops rotating.	Delivers the final page out of the printer and cleans the transfer charging roller.	If a print instruction command is received from the formatter, the printer bypasses the WAIT and STANDBY periods and immediately enters the INTR period.

Printer timing

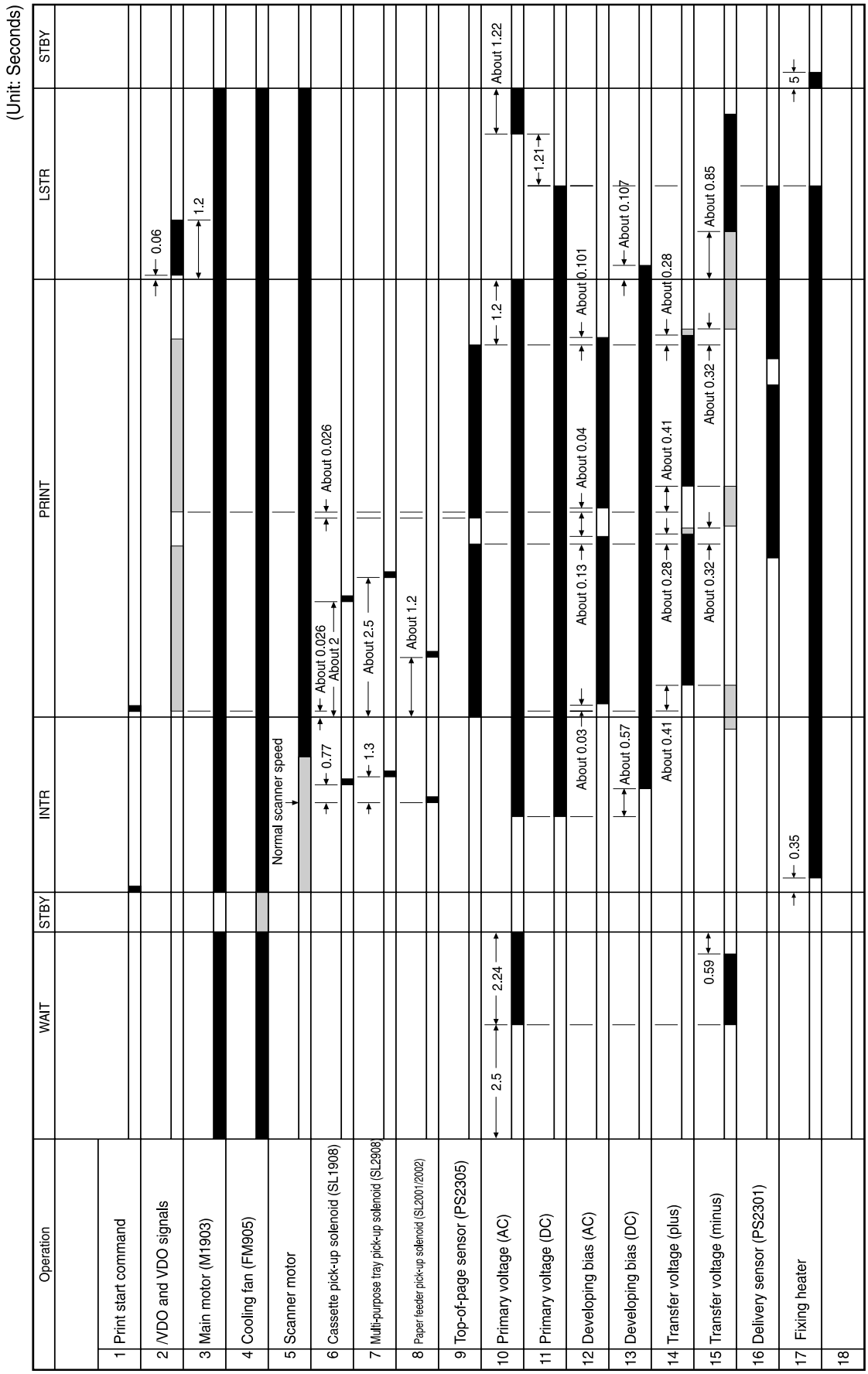

Figure 34. **Timing chart**

Printer functionality and operation

Four major systems make up the HP LaserJet 2200 printer and allow it to operate. Each system works independently to accomplish its task, but must be coordinated with the other systems to successfully produce a printed page. Understanding these systems, their function, and how they interact with each other is the key to troubleshooting any problem. See "Troubleshooting process" in chapter 7 for detailed information about the HP LaserJet 2200.

The HP LaserJet 2200 printer's four major systems are as follows:

- "Formatter system" page 74—Receives print data from the host, processes the image, and transfers it to the engine control system. The formatter system also provides the interface between the user and the printer (control panel).
- "Engine control system" page 77—Monitors and controls all of the printer's mechanical and electrical subsystems. It is the center of the printer's operation.
- "Image formation system" page 80—Produces the actual physical image on the page.
- "Pickup/feed system" page 86—Moves paper or other print media through the printer from one of the selected input trays (tray 1, 2, or 3) to the selected output bin (top or rear).

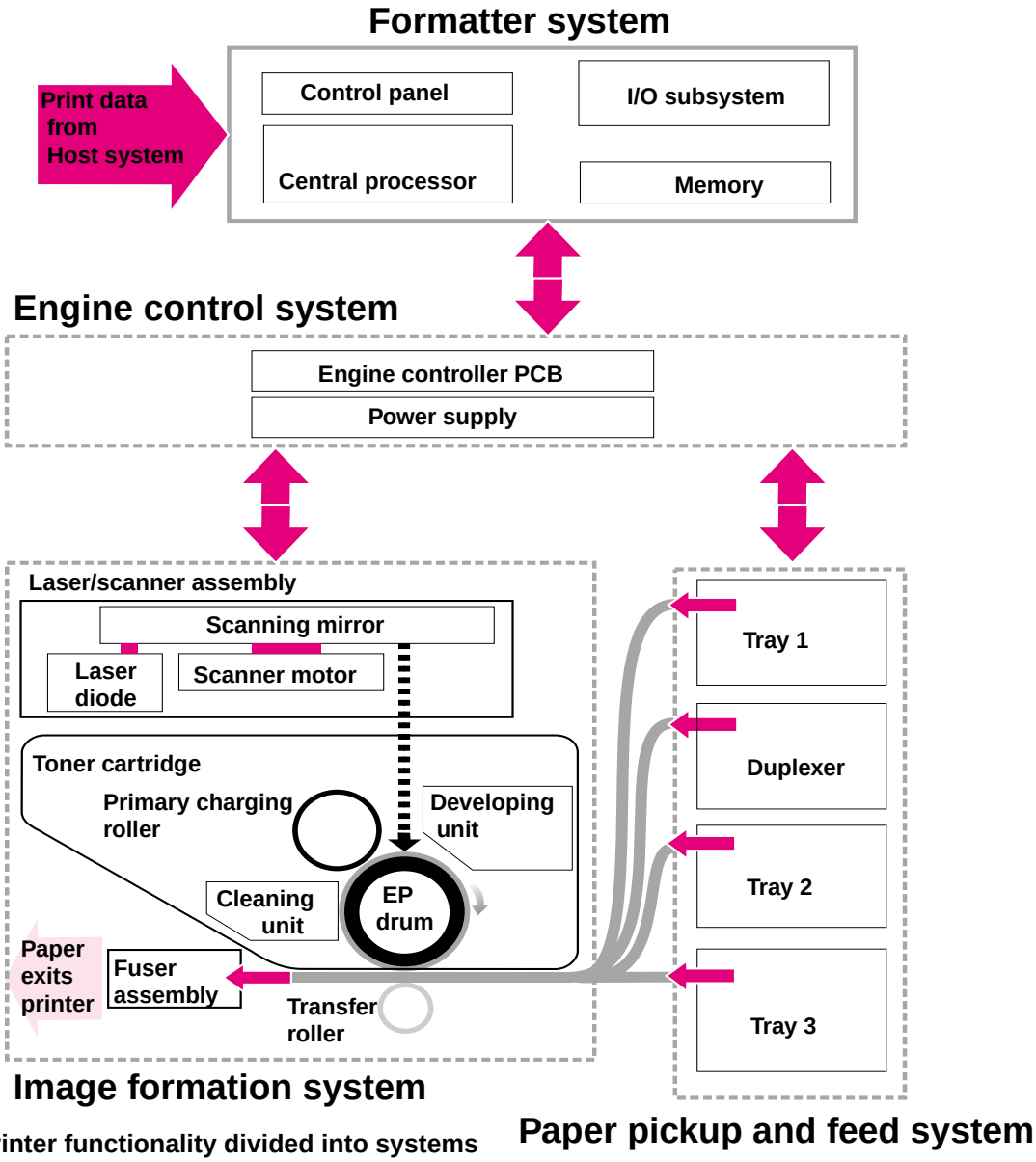

Figure 35. **Printer functionality divided into systems**

Formatter system

The formatter system is responsible for the following:

- receiving and processing data from the various printer interfaces
- monitoring control panel input and relaying printer status information (through the control panel and the I/O)
- developing and coordinating data placement and timing with the print engine
- storing font information and macros
- communicating with the host computer

The formatter receives data from the I/O and converts it into a dot image. The formatter then sends a print signal to the engine controller assembly. The engine controller assembly synchronizes the image-formation system with the paper-feed system, and signals the formatter to send the print-image data. The formatter sends the print-image data (dots) in the form of a video signal and the printing process begins.

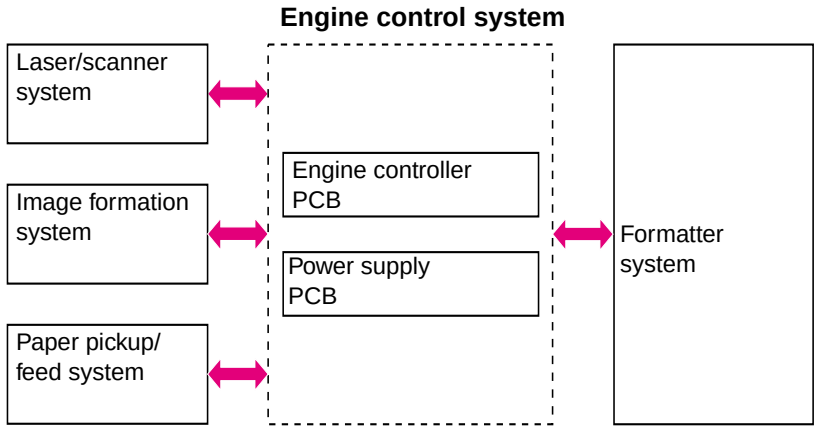

Figure 36. **Formatter system**

Formatter hardware

The formatter system contains the following:

- **CPU**—Is a 133 Mhz Motorola Coldfire V4 with a 66 MHz bus.
- **Read-only memory (ROM)**—Stores the dot patterns of internal character sets (fonts) in addition to storing microprocessor control programs.
- **Random-access memory (RAM)**—Stores printing and font information received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine. Increasing the RAM will increase performance of graphic intense printing operations but it will not increase the I/O buffer space or cause the printer to print more pages per minute.
- **Nonvolatile memory (NVRAM)**—Stores information about the I/O and print environment configuration. The printer keeps the contents of NVRAM when the power is turned off or disconnected. (As in other HP LaserJet printers, downloaded fonts and macros are saved in conventional RAM and are lost when power is turned off.)
- Interfaces
  - **Parallel interface**—Receives incoming data through its IEEE1284 B interface connector. The IEEE1284 B interface provides high-speed, two-way communication between the printer and the host, letting the user change printer settings from the host computer.
  - **USB**—Receives incoming data through its universal serial bus (USB) connector. The USB interface provides high-speed, two-way communication between the printer and the host, letting the user change printer settings computer.
  - **EIO**—The PCI-based enhanced input/output (EIO) slots support a wide range of print servers and other add-on devices. HP JetDirect EIO cards provide high-speed, two-way communication for network printing over Ethernet, Ethernet and LocalTalk, Token Ring, or Fast Ethernet networks.
  - **FIR**—This port is compliant with the specifications determined by the Infrared Data Association (IrDA). On the right side of the FIR port is a status light that indicates when the port is active. The FIR port transmits data at speeds of up to 4 MB per second. When the infrared (IR) connection is established, the FIR status light comes on. If the connection is broken, or when the print job is complete, the FIR status light goes off.

Formatter subsystem

Resolution Enhancement technology (300 and 600 dpi only)

Contains circuitry for Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the engine controller assembly to produce smoothed black-to-white boundaries. The default is on.

Print-density adjustment

Affects the line width (boldness) of the print image. This is accomplished by varying the developer dc bias, which controls the amount of toner applied to the photosensitive drum. Settings range from 1 (lightest) to 5 (darkest). The default is 3.

EconoMode

Uses approximately 50 percent less toner than standard mode printing by reducing the dot density. Users can adjust EconoMode, which can also be thought of as draft mode, through software applications. The default setting is off. EconoMode does not affect print speed or memory usage.

Memory management

This printer uses various methods to conserve and make the most of available memory. Several of these methods are explained below.

Memory Enhancement technology (MEt)

MEt enhances the printer's standard memory through a variety of font and data compression methods. MEt also automatically compresses fonts for desktop publishing applications. MEt is available in all printing modes (PCL 5e, PCL 6, and HP PS emulation). When printing graphics, MEt analyzes each page as it is being printed and automatically applies a variety of compression techniques to print the complete page at the correct resolution.

Image Adapt

Image Adapt uses a compression technique to allow printing of full-page graphics using the printer's base memory. Image Adapt is only used in PCL 5e (PCL 6 and HP PS emulation do not require Image Adapt). The available settings are auto, on, and off. The default is auto.

If Image Adapt is used some data might be lost. To see if there has been some loss of graphic detail, print a self-test page and check the Image Adapt Used line in the Printer Information section. If the printer invoked Image Adapt since the last time the self test was printed (or the last time the printer was turned off and on), that line reads “Image Adapt Used: Yes.”

Page Protect

A page's complexity (rules, complex graphics, or dense text) might exceed the printer's ability to create the page image fast enough to keep pace with the engine's printing process. If a page is too complex, it might print in parts (for example, the top half of data on one page and the bottom half on the next page). Some print data loss is likely in these instances, and the printer's Attention light flashes.

Page Protect allows the formatter to create the entire page image in memory before moving the paper through the printer. This process ensures that the entire page is printed. The default is off, which provides the best performance. Page Protect should only be enabled when necessary.

Printer Job Language overview

Printer Job Language (PJL) is an integral part of the printer’s configuration, in addition to the standard Printer Command Language (PCL). PJL allows the printer to perform functions such as:

- **Two-way communication** with the host computer through an IEEE1284 B interface connection. The printer can tell the host such things as the control panel settings and allow the control panel settings to be set from the host.
- **Dynamic I/O switching** allows the printer to be configured with a host on each I/O. The printer can receive data from more than one I/O simultaneously until the buffer is full. This can occur even when the printer is offline.
- **Context-sensitive switching** allows the printer to automatically recognize the personalities (PS or PCL) of each host and configure itself to serve that personality.
- **Isolating print environment settings** from one print job to the next. For example, if a print job is sent to the printer in landscape mode, subsequent print jobs only print in landscape if they are formatted for landscape printing.

For more information, see the *HP LaserJet 2200 Series Printer Software Technical Reference*. The complete PJL Status Code listing is contained in the appendix of the *Printer Job Language Technical Reference*. Also see HP’s website at www.hp.com.

Engine control system

The engine control system consists of the engine controller PCB and the power supply assembly. The engine controller PCB coordinates all print engine activities. The figure below illustrates the block diagram of this system, and the description of each subsystem follows.

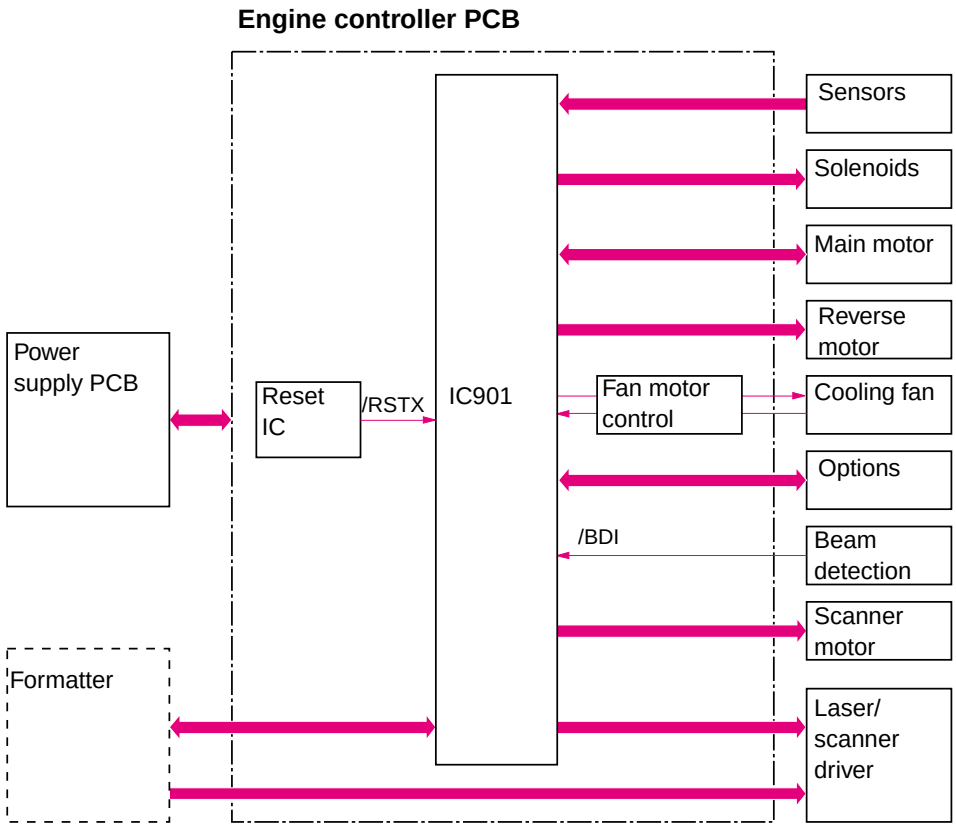

Figure 37. **Engine control system**

The engine control system directly controls the following subsystems:

- laser/scanner control
- paper-feed control
- microswitch control
- motor control
- fuser-assembly control
- power supply and control

Engine control subsystems

Laser/scanner control

Based on information received from the engine controller PCB, the formatter sends a direct signal to modulate the laser diode on and off. The modulated laser beam strikes the surface of a rotating scanning mirror, then a focusing lens directs the beam onto the photosensitive drum.

The printing system synchronizes the process by continuously monitoring the beam detect signal.

Paper-feed control

The engine controller PCB controls paper motion by continuously monitoring the various paper-sensor levers, and coordinating the timing with the other print processes and systems. See “Pickup/feed system” on page 86.

Microswitch control

The engine controller PCB controls the following microswitches and reports any errors to the formatter:

- Top door and toner cartridge switch. Activated if the top door is open. The toner cartridge is detected electronically.
- Engine test switch. Activated manually through an access hole on the side of the gear plate. This switch causes the print engine to perform a self-test diagnostic, bypassing the formatter. See "Engine test" in chapter 7.

Motor control

The engine controller PCB controls the following motors and reports any failures to the formatter. See “Basic print-period operating sequences” on page 71.

- Main motor. Rotates during interim period (following initial power on), print, and last rotation, or when the top cover is opened or closed.
- Scanner motor. Operates during the interim period and the print period.
- Fan motor. Rotates at full speed while the main motor is rotating and continues rotating for 30 seconds after the main motor stops. Rotates at full speed, half speed, and then stops during power-on and the standby period.
- Reverse motor. A stepping motor responsible for changing the paper direction. It is capable of clockwise and counterclockwise rotation.

Fuser-assembly control

The fuser assembly’s film contains a heater. The engine controller PCB controls the fuser heater during the following temperature modes. See “Basic print-period operating sequences” on page 71.

- initial
- print
- between-page
- postprint

The engine controller PCB maintains the fuser at a temperature of 195 degrees C (383 degrees F) during print temperature mode. If the fuser system overheats, reaching about 220 degrees C (428 degrees F), a relay opens the power circuit to the fuser heater, causing a fuser error message. If the fuser system exceeds 230 degrees C (446 degrees F), the thermal fuse melts, cutting off power to the fuser assembly. The engine controller PCB monitors the fuser heater temperature through a thermistor.

Power supply and control

- The power switch supplies ac power to the low-voltage power supply circuit when it is turned on. This circuit supplies dc voltage (+24V, +5V, +3.3V) to the main motor, laser/scanner unit, interlock switch, formatter, solenoids, paper feeder, high-voltage power supply, and formatter.
- The dc voltage supplied to the high-voltage power supply circuit is interrupted when the top cover is open.
- The overcurrent/overvoltage protection circuit in the low-voltage power supply automatically turns off the output voltage when an overcurrent condition occurs because of a short or abnormal voltage on the load side.
- When input power is turned off then on, the protection circuit automatically resets. The low-voltage power supply circuit also contains a fuse that shuts off the power supply to the circuit when overcurrent conditions occur. See “Engine control system” on page 77.

In response to the engine controller PCB, the high-voltage power supply circuit supplies dc and ac voltage to the various parts of the image formation system.

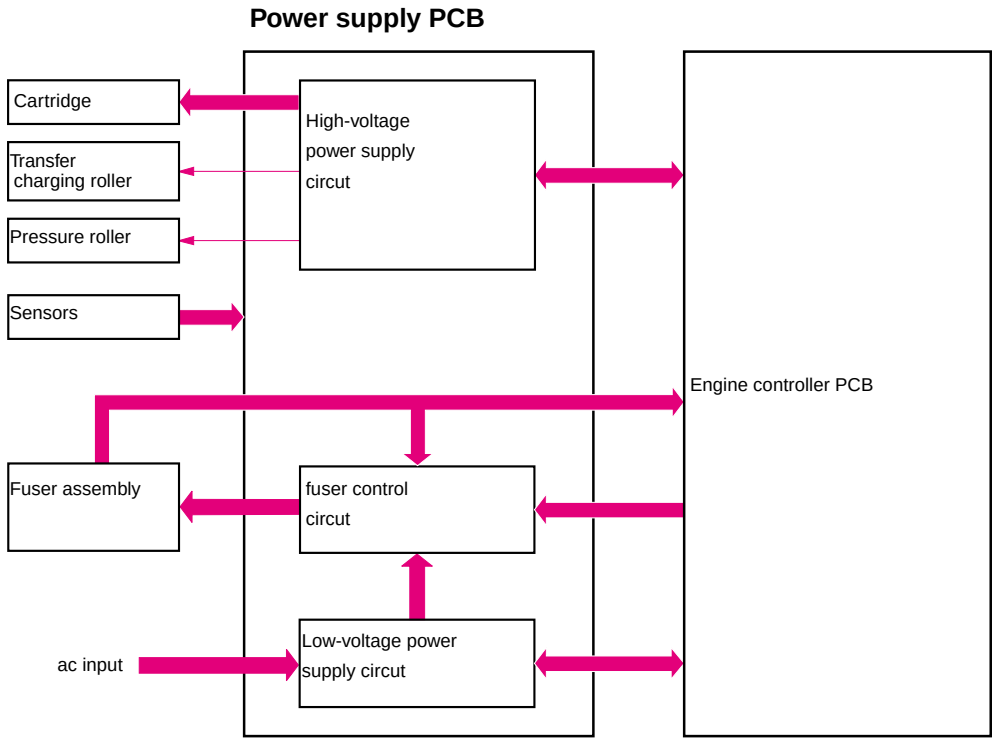

Figure 38. **Power supply PCB**

Image formation system

The image formation system is the central hub of the printer. The system consists of the cartridge, transfer charging roller, and fuser unit.

When a print command is sent from the formatter, the engine controller drives the main motor to rotate the photosensitive drum, primary charging roller, developing cylinder, transfer charging roller, and pressure roller.

The primary charging roller uniformly applies negative charges to the photosensitive drum surface. To form a latent image on the photosensitive drum, the laser beam modulated by the video signals is exposed on the photosensitive drum surface.

The toner on the developing cylinder develops the latent image formed on the photosensitive drum into a visible image, which is transferred onto media by the transfer charging roller. The transferred toner is changed to a permanent image by heat and pressure in the fuser unit. The cleaning blade scrapes off residual toner on the photosensitive drum. The potential on the drum is made uniform by the primary charging roller in preparation for the next latent image.

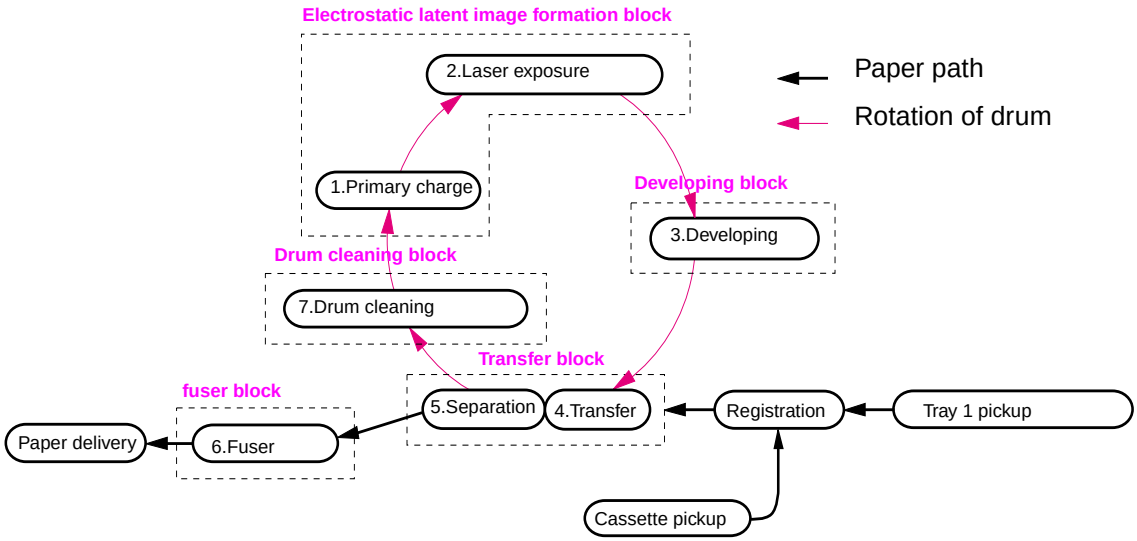

Figure 39. **Image formation system**

Print process

The toner cartridge contains the cleaning, conditioning, and developing stages of the image formation process. These components are subject to wear and are built into the replaceable toner cartridge. This eliminates the need for a service call when replacement is required.

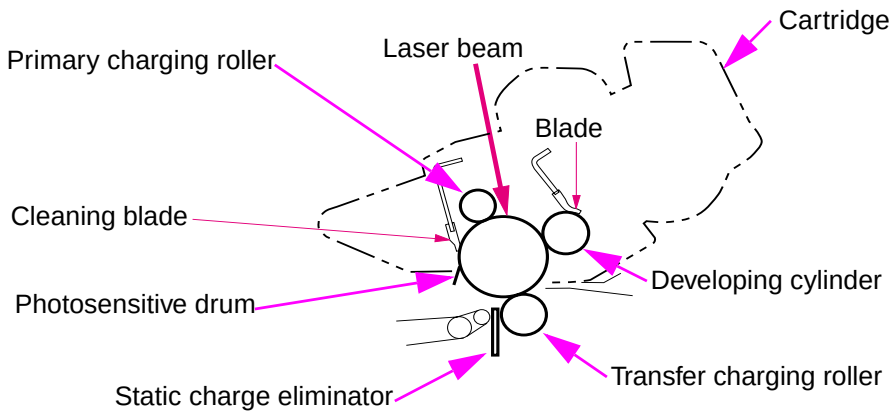

Figure 40. **Toner cartridge**

Photosensitive drum

The photosensitive drum is the heart of the image formation system. This drum's special properties allow an image to form on the drum's surface and then transfer to paper. The drum is an aluminum cylinder coated with an organic-photoconductive material (OPC). The photosensitive drum's aluminum base is electrically connected to ground. The OPC material becomes electrically conductive when exposed to light. Areas not exposed to light remain nonconductive and maintain their negative charge.

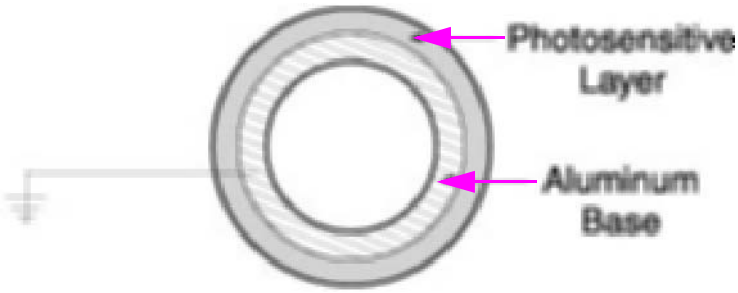

Figure 41. **Photosensitive drum**

Cleaning stage

At the cleaning stage, the photosensitive drum's surface is prepared to hold an image. During printing, the drum rotates completely several times per printed page. Before forming the image for a given section of print, a cleaning blade removes toner from the previous rotation of the drum. The toner cartridge stores waste toner and prevents it from being used in later print jobs.

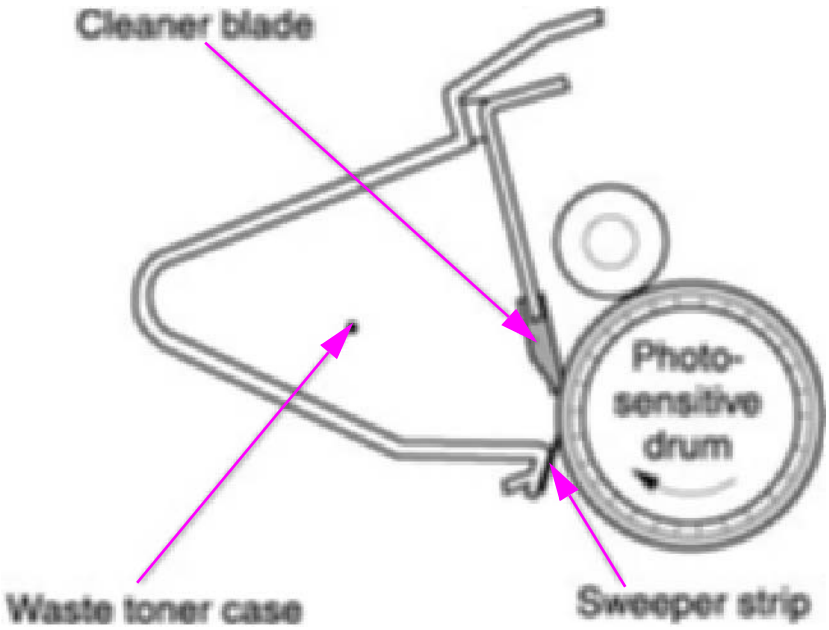

Figure 42. **Cleaning stage**

Conditioning stage

At the conditioning stage, the primary charging roller applies a uniform negative charge on the photosensitive drum's surface. The primary charging roller erases any residual charges and maintains a constant potential on the drum's surface. In addition, the primary charging roller creates a uniform negative potential on the drum's surface.

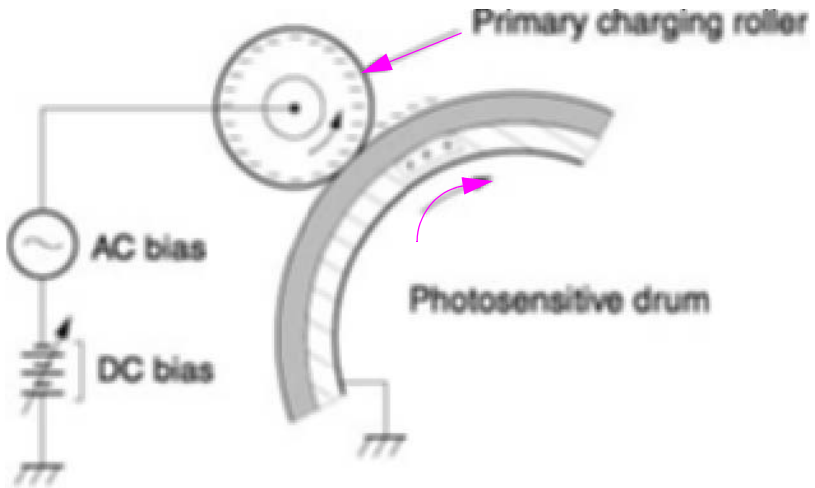

Figure 43. **Primary charging roller**

Writing stage

At the laser/scanner assembly, two laser beams focus onto the photosensitive drum and discharge the drum's negative potential. This creates a latent electrostatic image, which later is developed into a visible image.

Two small laser diode beams shine onto a rotating, six-sided mirror. As the mirror rotates, the beams reflect off the mirror and sweep the page from left to right.

A set of lenses and mirrors focuses the horizontal sweeping beams through the beam access slots in the rear of the toner cartridge and onto the photosensitive drum. Because the beams sweep the entire length of the drum while the drum rotates, the entire circumference of the drum can be covered. Each successive sweep of the beams is offset 1/1200th of an inch. This is how the printer achieves its 1200 dpi resolution.

At the beginning of each sweep (before the beams reach the drum), the beam detect mirror reflects the beams. The momentary pulse of light goes to the engine controller PCB, which converts the light to an electrical signal used to synchronize other activities in the printer and to diagnose problems with the laser/scanner assembly.

Portions of the drum not exposed to the laser still contain the uniform negative potential (placed there by the primary charging roller), but those portions exposed to light have been discharged to ground to form the latent electrostatic image.

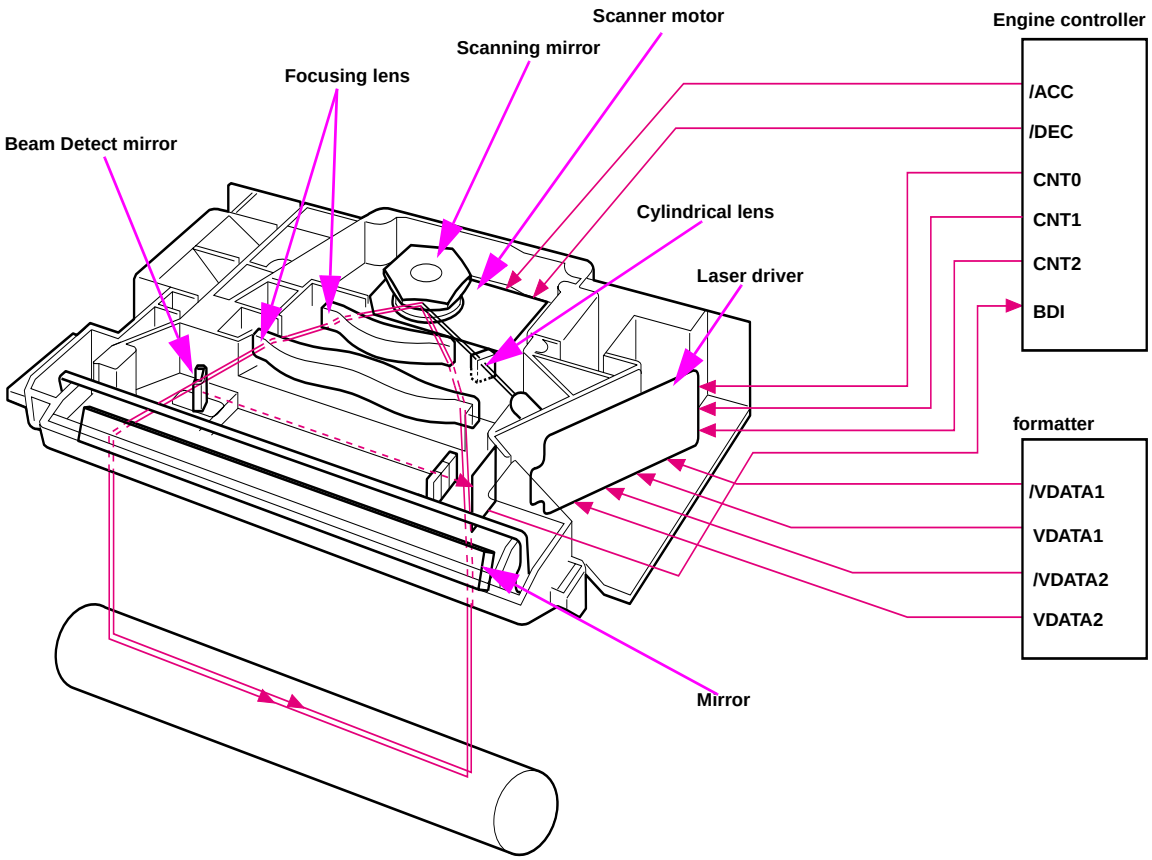

Figure 44. **Laser/scanner system**

Developing stage

At the developing stage, the latent electrostatic image is developed into a visible image on the photosensitive drum. The developing cylinder consists of a metallic cylinder that rotates around a fixed magnetic core inside the toner cavity. Toner is a powdery substance made of black, plastic resin bound to iron particles, which the magnetic core of the developing cylinder attracts. A rubber blade brushes the toner on the developing cylinder to a uniform thickness.

Note

Charges in the photosensitive drum's exposed areas are shown as positive in figure 45 even though they are actually negative. This means that the photosensitive drum potential is higher than that of the developing cylinder.

To obtain a negative surface charge, the toner particles rub against each other and the developing cylinder which is connected to a negative dc supply. The discharged (grounded) areas of the drum exposed to laser light attract the negatively charged toner. The negatively charged (non-exposed) areas repel the toner. An ac potential is applied to the developing cylinder to decrease the attraction between the toner and the cylinder's magnetic core and to increase the repelling action of toner against the areas of the drum not exposed to laser light. This ac potential improves density and contrast.

The print density setting (through the software) adjusts the developing cylinder's dc bias to change the force of attraction between the toner and drum.

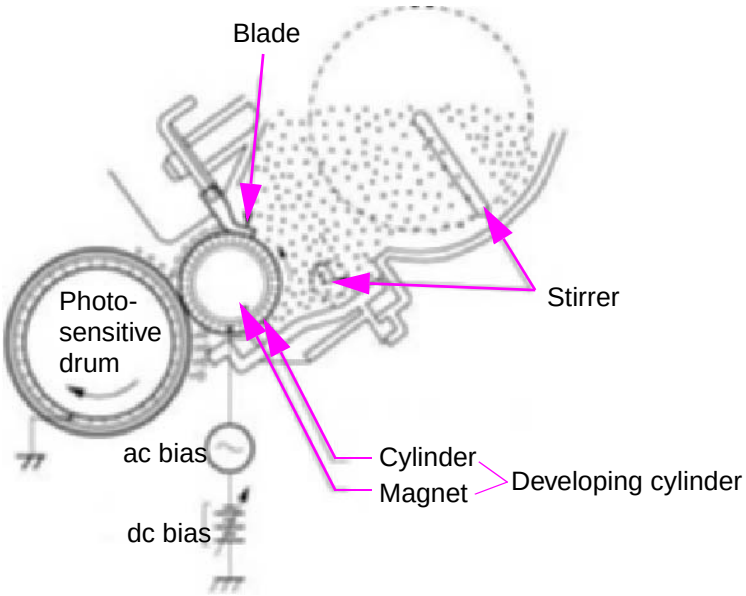

Figure 45. **Latent electrostatic image formation**

Transferring stage

At the transferring stage, the toner image on the photosensitive drum's surface is moved to the paper. The transfer roller applies a positive charge to the back of the paper, causing the paper to attract the negatively charged toner on the drum's surface.

The drum's small radius combined with the stiffness of the paper causes the paper to peel away from the drum. The static charge eliminator helps separate the paper from the drum by weakening the attractive forces between the negatively charged drum surface and the positively charged paper. Without this help, thin paper might wrap around the drum. The static charge eliminator also prevents droplets on the printed image at low temperature and humidity. After separation, the paper moves to the fuser station and the drum rotates to the cleaning and conditioning stations.

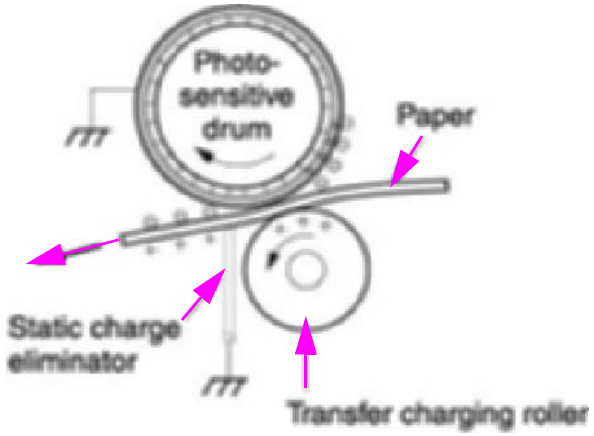

Figure 46. **Transferring the toner image on the drum**

Fuser stage

At the fuser stage, heat and pressure fuse the toner to the paper to produce a permanent image. The paper passes between a fuser film and a pressure roller. The fuser film melts the toner while the pressure roller compresses it into the paper.

To prevent the toner from dispersing during the fuser stage, this printer applies a negative dc voltage to the fuser film via the pressure roller shaft. A negative charge is applied to the surface of the paper, which improves the adhesion force of the toner particles to the paper and prevents dispersion of the toner particles.

The fuser heater comes up to fuser temperature very quickly and thus does not require any power while the printer is on STBY. This feature saves power while virtually eliminating the warm-up period (less than 10 seconds).

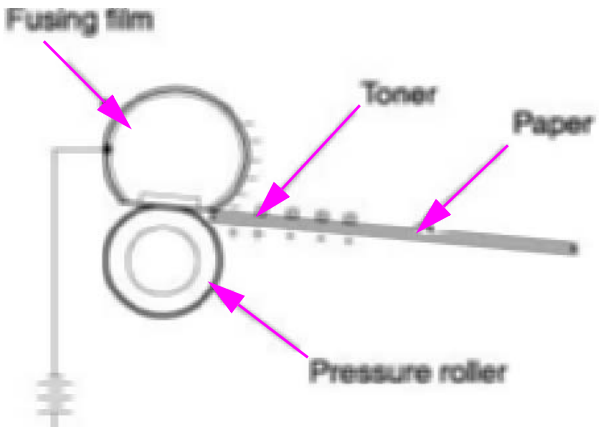

Figure 47. **Fuser film and pressure roller**

Pickup/feed system

When the formatter sends a print command to the engine controller PCB, the main motor and scanner motor start rotating and the fuser heater temperature control starts.

The paper feed system automatically picks print media from tray 1, tray 2, or tray 3 (if installed) and delivers it to the registration roller. Before the media reaches the registration roller, the separation pad separates any excess sheets of media, and the registration shutter corrects the media skew.

After the top-of-page sensor detects the leading edge of the page, the engine controller PCB sends a signal to the formatter. This signal functions as a synchronization between the engine controller PCB and the formatter. This synchronization allows the leading edge of the image on the photosensitive drum to match the leading edge of the page. After the transferring stage of the image formation process, the paper is fed to the fuser assembly by the feed belts.

The delivery sensor detects the exiting paper, which is usually fed to the top or rear output bin unless duplex is enabled.

To print duplex, this printer prints one side of paper, transports it to the face-down tray once, and then reverses the paper by feeding it back to the duplex feed unit.

The face-up sensor detects paper delivered face-down, with one side printed.

The delivery sensor detects the trailing edge of the paper, then signals the engine controller. The engine controller rotates the reverse motor counterclockwise to send the paper to the duplexer feed unit.

The reversed paper sensor receives the paper, then signals the engine controller to turn the duplexer solenoid on. The paper is transported by the oblique roller to the registration roller. If next paper is picked up, the duplex-fed paper stops at the specified position. The top page sensor senses the next paper, the specified period of time passes, then the duplex-fed paper is retransported.

The retransported paper is printed with the other side and delivered to the face-down tray.

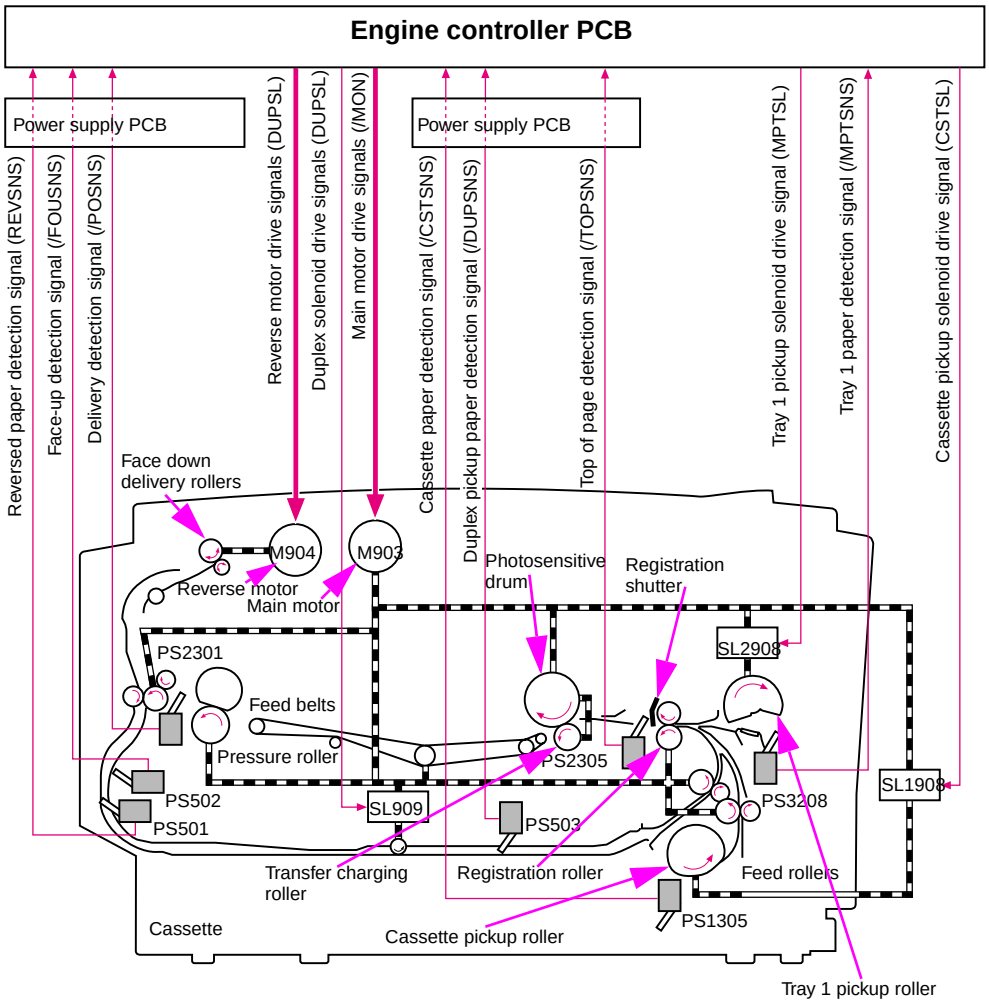

Figure 48. **Pickup/feed system**

PS501: Reversed paper sensor

PS502: Face-up sensor

PS503: Duplex pickup paper sensor

PS1305: Cassette paper sensor

PS2301: Delivery sensor

PS2305: Top-of-page sensor

PS3208: Tray 1 paper sensor

SL909: Duplex solenoid

SL1908: Cassette pickup solenoid

SL2908: Tray 1 pickup solenoid

Sheet feeder

There are two optional sheet feeders: the 250-sheet feeder and the 500-sheet feeder.

The sheet feeders are driven by the printer and controlled by the printer's engine controller. The engine controller drives the solenoid at a necessary timing through the sheet feeder PCB. The paper sensor detects media.

The sheet feeder picks up media loaded in the cassettes and transports it to the printer.

The flow of media is illustrated in figure 49 (the 500-sheet paper feeder shown).

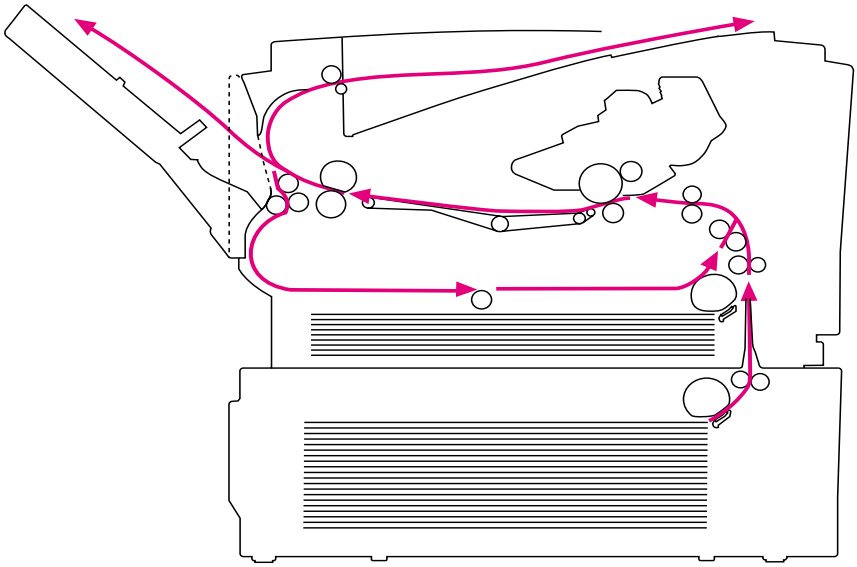

Figure 49. **Pickup feed paper-path**

The main motor (M903) drives sheet feeder through the use of gears.

When a print command is received from the formatter, the main motor (M903), reverse motor (M904), and scanner motor start rotating. The heating element temperature begins to rise.

The sheet feeder pickup solenoids (SL2001, SL2002) are turned on when the following three requirements are met:

- the main motor has been driven for 0.35 seconds
- the scanner motor has reached the specified rotation number
- the heating element temperature has been brought to the specified temperature, or the specified period of time has elapsed after start of the temperature control

SL2001 and SL2002 transmit the main motor's rotation to the pickup roller. The pickup roller makes a rotation to pick up media in the cassette.

The separation pad separates the media and transports it to the printer. The media goes through the transfer, separation, and fuser/delivery blocks, and is delivered to the selected tray.

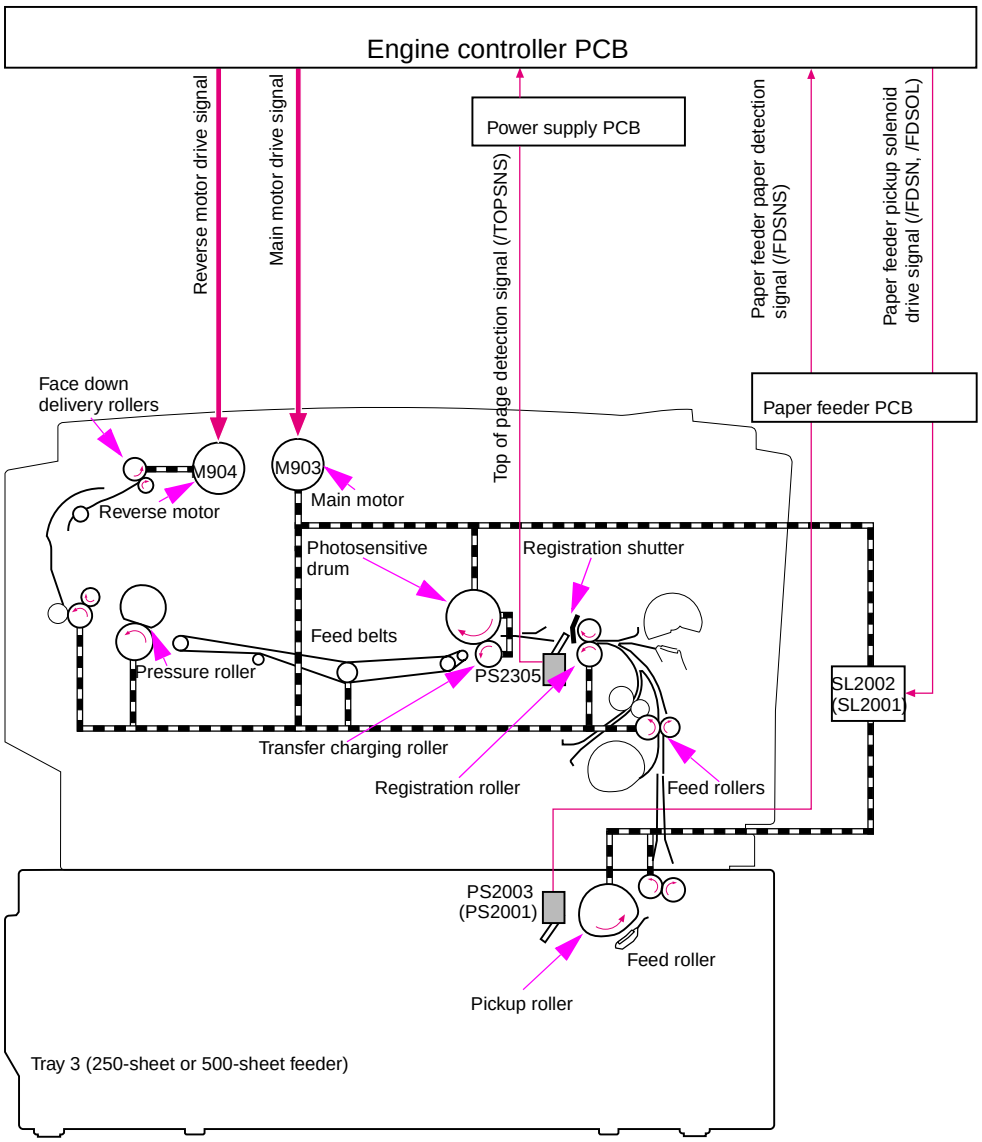

Figure 50. **Pickup feed**

PS2305: Top-of-page sensor (printer)

PS2001: Paper feeder paper sensor (250-sheet)

PS2003: Paper feeder paper sensor (500-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

SL2002: Paper feeder pickup solenoid (500-sheet)

Media detection

The model for media detection is essentially the same for all three trays.The paper sensor levers shown below detect the presence of media in the trays. If the sensor does not detect any media, the formatter illuminates the display LED until media is added.

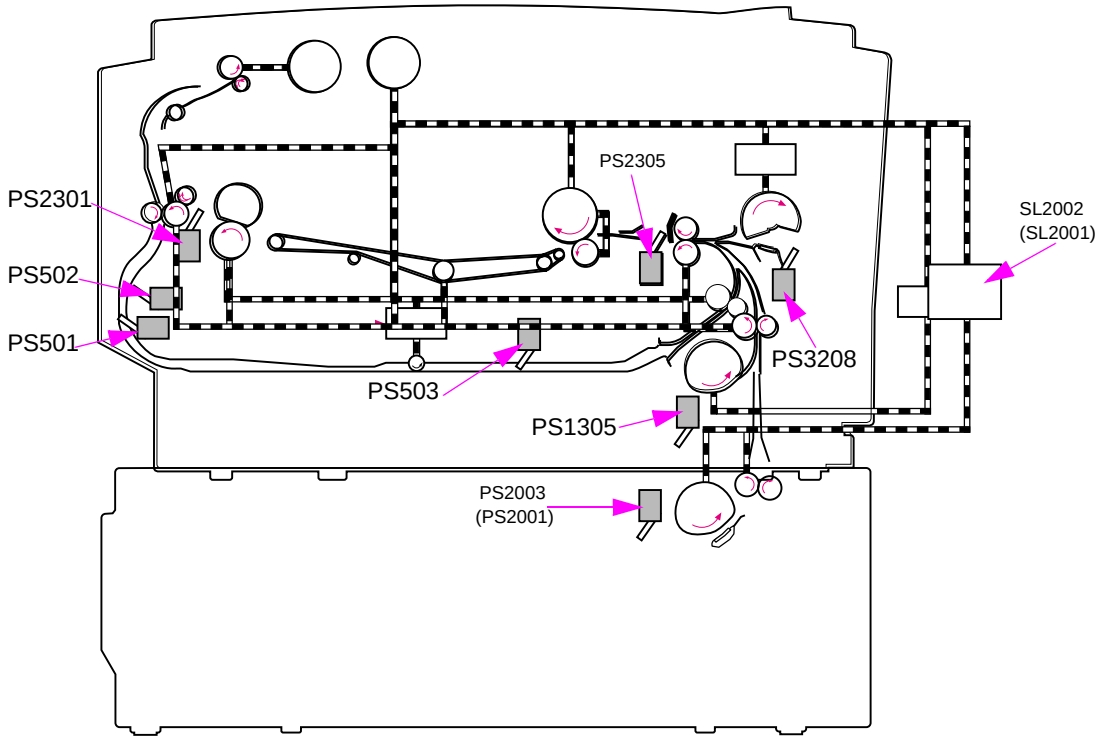

Figure 51. **Media detection sensors**

PS2305: Top-of-page sensor (printer)

PS2003: Paper feeder paper sensor (500-sheet)

SL2002: Paper feeder pickup solenoid (500-sheet)

PS501: Reversed paper sensor

PS503: Duplex pickup paper sensor

PS2301: Delivery sensor

PS2001: Paper feeder paper sensor (250-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

PS502: Face-up sensor

PS1305: Cassette paper sensor

PS3208: Tray 1 paper sensor

Media-size detection

The HP LaserJet 2200 printer does not contain a media-size detection mechanism; therefore, the printer cannot detect the size of media set in the trays. The printer detects the media size by measuring the time from when the top-of-page sensor detects the leading edge of the page until the trailing edge of the page clears the sensor.

Jam detection

The presence of media and paper-feed condition are detected by:

- top-of-page sensor (PS2305)
- delivery sensor (PS2301)
- reversed paper sensor (PS501)
- duplexer pickup paper sensor (PS503)

A jam is detected by the CPU checking for the presence of media through sensors at the timing stored in the CPU.

If the CPU determines a jam, it stops the print operation and notifies the formatter of a jam.

Pickup sensors

Pickup delay jam

This printer performs retry control to readdress the pickup delay jam caused by pickup error. Pickup operation is conducted a maximum of twice at the all pickup sources except for the duplex feed unit.

If the top-of-page sensor (PS2305) cannot detect the media leading edge within a specified period of time (T) the printer performs the pickup operation again. If PS2305 cannot detect the media leading edge within the specified period of time (T), a jam is indicated.

- Paper pickup from the tray1: T=about 2.5 seconds
- Paper pickup from the cassette: T=about 3.0 seconds
- Paper pickup from the paper feeder: T=about 4.4 seconds
- Paper pickup from the duplexer feed unit: T=about 4.5 seconds

Pickup stationary jam

A. When WAIT period starts—a pickup stationary jam is assessed if the top-of-page sensor detects media when the WAIT period starts.

B. During media feeding—a pickup stationary jam is assessed if the top-of-page sensor (PS2305) does not detect the trailing edge of the media within 3.8 seconds after detecting the leading edge.

Delivery sensors

Delivery delay jam

A delivery delay jam is assessed if the media does not reach the delivery sensor (PS2301) within a specified period of time (T) after the top-of-page sensor (PS2305) detects the leading edge.

- paper 270 mm or more: T=about 2.6 seconds
- paper 200 mm to 270 mm: T=about 2.7 seconds
- paper less than 200 mm: T=about 4.6 seconds

Delivery stationary jam

A. When WAIT period starts—a delivery stationary jam is assessed if the delivery sensor (PS2301) detects media when the WAIT period starts.

B. During media feeding—a delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within a specified period of time (T) after the top-of-page sensor (PS2305) detects the trailing edge.

- paper 200 mm or more: T=about 2.7 seconds
- paper less than 200 mm: T=about 5.2 seconds

C. When a pickup delay jam occurs—the printer enters the last rotation period to deliver the jammed media. A delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within 8 seconds after the completion of the forced laser emission.

D. During pressure roller cleaning—a delivery stationary jam is assessed if the delivery sensor (PS2301) does not detect the trailing edge of the media within 8 seconds after the 35th feed operation.

Reversing sensors

Reversing delay jam

A reversing delay jam is assessed if the reversed paper sensor (PS501) does not detect the leading edge of the media within 3.9 seconds after the reversing motor starts rotating.

Reversing stationary jam

A reversing stationary jam is assessed when the reversed paper sensor (PS501) detects media after duplex pickup operation has been performed for about 0.77 seconds.

Duplexer sensors

Duplexer pickup delay jam

A duplexer pickup delay jam is assessed if the duplexer pickup paper sensor (PS503) does not detect media within 4.9 seconds after the reversed paper sensor (PS501) detects the leading edge.

Duplexer pickup stationary jam

A duplexer pickup stationary jam is assessed if the duplexer pickup paper sensor (PS503) detects media after about 3.4 seconds has passed since the reversed paper sensor (PS501) detected the trailing edge.

Paper-feed sensor

Paper feeder jam detection

Jam detection for the paper feeders during the pickup and feed operations is same as that for the printer. For jam detection, see "Pickup delay jam" on page 91.

6 Removal and replacement

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Removal and replacement strategies

This chapter documents removal and replacement of field replaceable units (FRUs) only.

Replace parts in the reverse order of their removal. If replacement requires difficult or critical installation procedures, notes are provided with detailed special instructions.

WARNING! To avoid serious injury, unplug the power cord from the power outlet before servicing the printer. Certain functional checks must be performed during troubleshooting with power supplied to the product. However, the power supply should be disconnected during disassembly.

Never operate or service the printer with the protective cover removed from the laser/scanner assembly. The reflected beam, although invisible, can damage eyes.

The clip gasket attached to the formatter's radio frequency interference (RFI) shield contains nickel. Do not touch the clip gasket with bare hands. Repair technicians should wear gloves to handle this gasket. Be advised in accordance with European Union Directive 76/769/EEC that ingestion of water-soluble nickel salts can cause nausea, vomiting, and diarrhea.

The printer might have sharp sheet metal edges. Exercise caution when working on the printer.

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, then carefully turn clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

Always remove the toner cartridge before removing or replacing assemblies and parts.

Note Note the lengths, diameters, and locations of screws. Be sure to use them in their original locations during reassembly.

Note Incorrectly routed or loose wire harnesses can interfere with other internal components and become damaged or broken. Frayed or pinched harness wires can be difficult to find. When replacing wire harnesses, always use provided wire loops, lance points, or wire-harness guides.

Required tools

The following tools are required used to remove and replace assemblies detailed in this chapter:

- Phillips #2 screwdriver with magnetic tip
- Small flatblade screwdriver
- Needle-nose pliers
- ESD mat

Toner cartridge removal and replacement

Remove the toner cartridge

Step 1 Open the toner cartridge door.

Figure 52. **Open the toner cartridge door**

Step 2 Grasp the toner cartridge and pull it back and up to remove it.

Figure 53. **Remove the toner cartridge**

Remove tray 3

Step 1 If installed, lift the printer up and off the sheet-feeder assembly.

Figure 54. **Remove tray 3 (500-sheet feeder shown)**

Remove the cassette from tray 2

Step 1 Position the printer as shown above.

Step 2 Firmly grasp the tray 2 cassette, and slide it out and away from the printer.

Figure 55. **Remove cassette from tray 2**

Remove I/O cover

Step 1 Push in the two tabs (callout 1) on the back of the I/O cover.

Step 2 Rotate the I/O cover away from the printer.

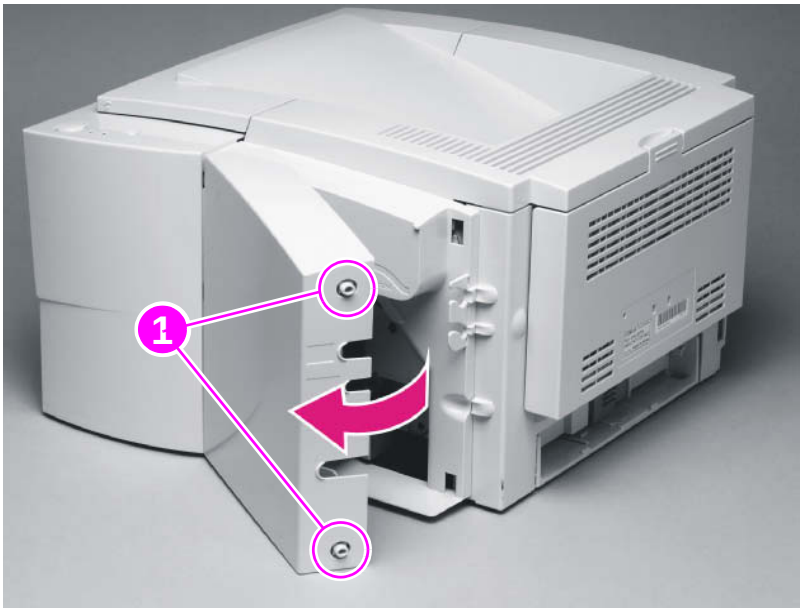

Figure 56. **Remove the I/O Cover**

Remove EIO card

Step 1 Remove two mount screws (callout 1).

Step 2 Grasp the EIO card, and pull it out of the connector.

Note Do not remove the Radio Frequency Interference (RFI) clip if it is installed.

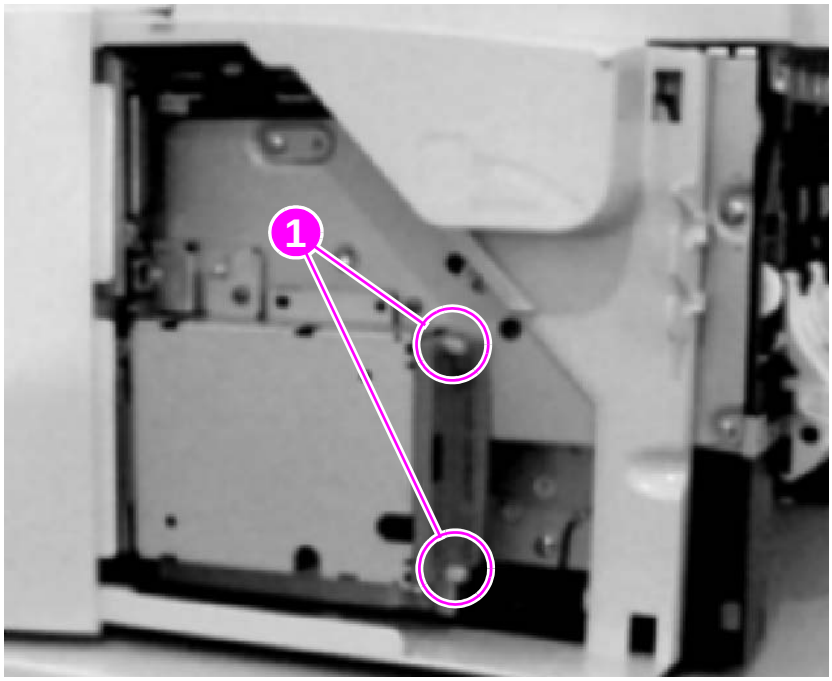

Figure 57. **Remove the EIO card**

Remove DIMM cover

Step 1 Open the toner cartridge door.

Step 2 Press and hold the release button (callout 1).

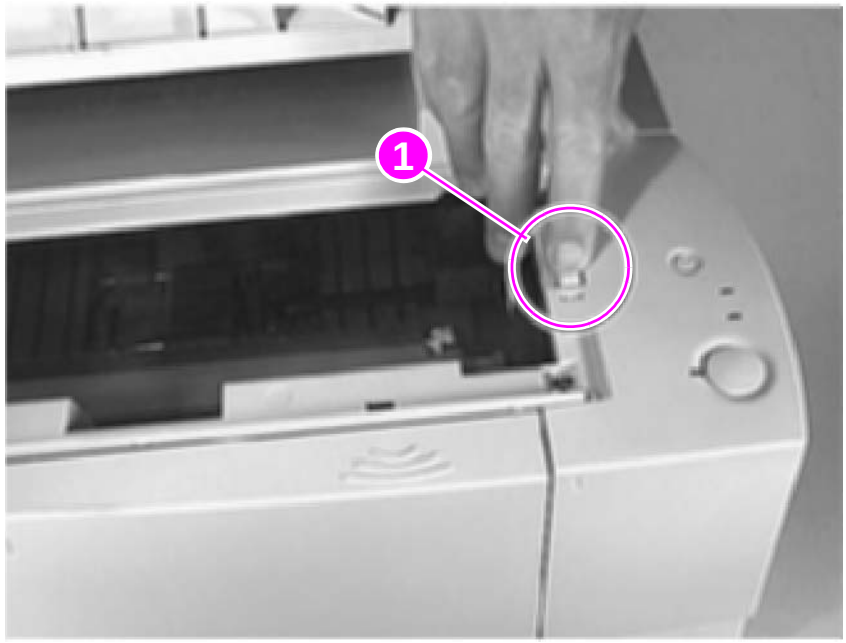

Figure 58. **DIMM cover release button**

Step 3 Slightly shift the cover forward (toward the front of the printer) and then outward away from the printer.

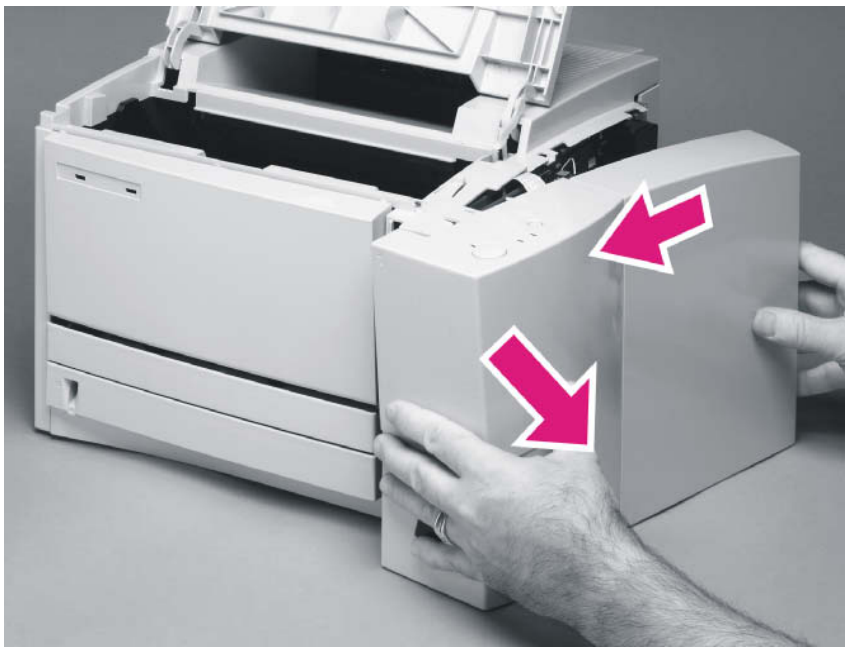

Figure 59. **Remove DIMM cover**

Remove rear cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.

Step 2 Open the rear output bin and release the diverter pivot pins (callout 1). Let the open door rest on the work surface.

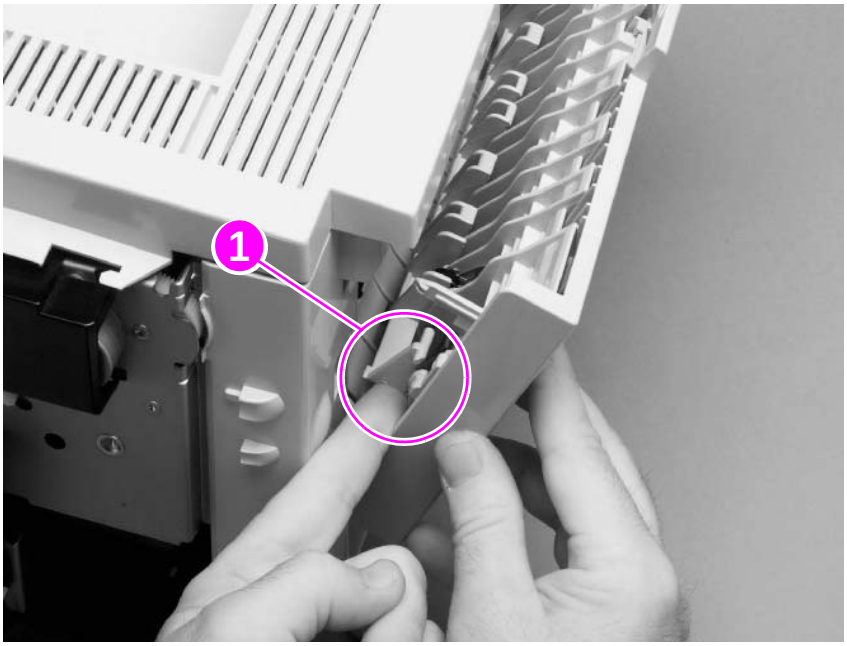

Figure 60. **Disengage the diverter locking pins**

Step 3 Remove the two mounting screws (callout 1).

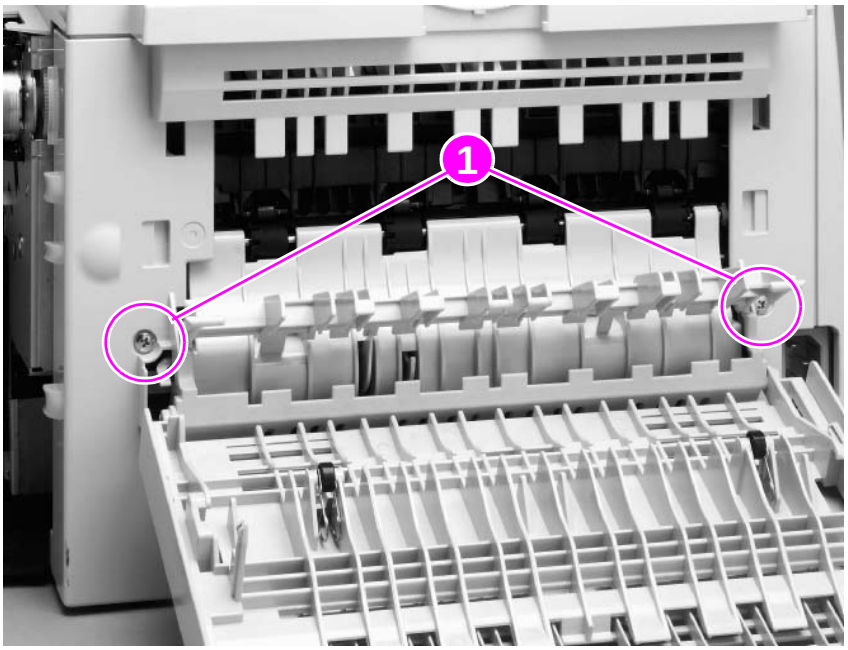

Figure 61. **Rear cover mounting screws**

Step 4 Raise the door to engage the retaining locking bar pivot pins and leave the door open.

Step 5 Unlatch the two rear cover retaining tabs located inside the tray 2 slide area.

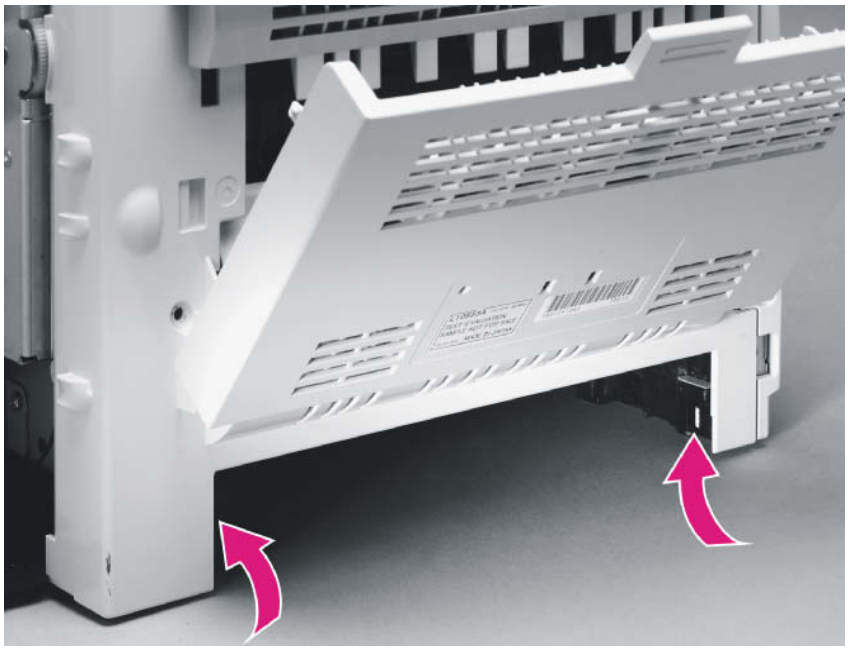

Figure 62. Rear cover retaining tabs

Step 6 Pull the rear cover down and then out to remove it.

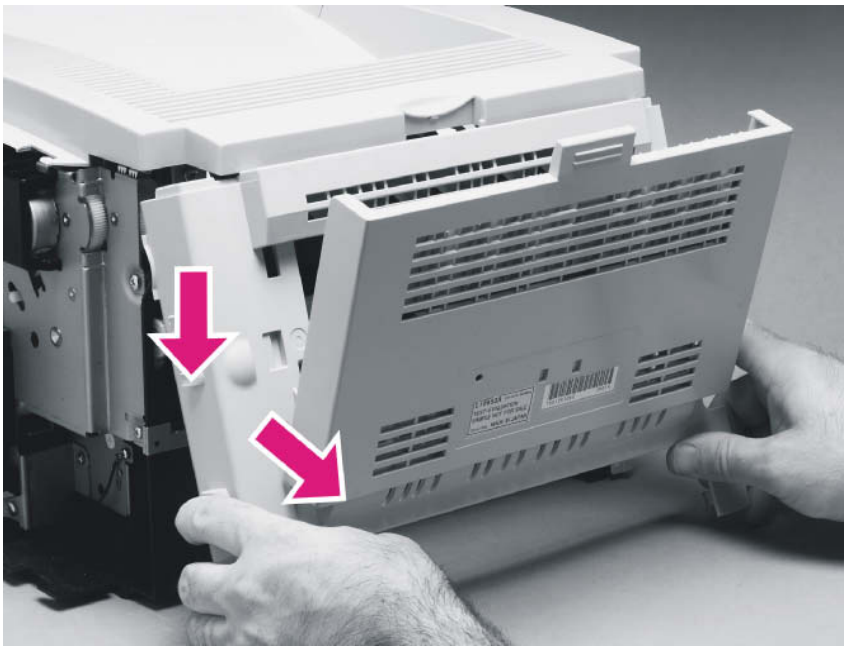

Figure 63. Remove rear cover

Remove top cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.

Step 2 Release the swing arm from the toner cartridge door (callout 1) and push it down into the opening.

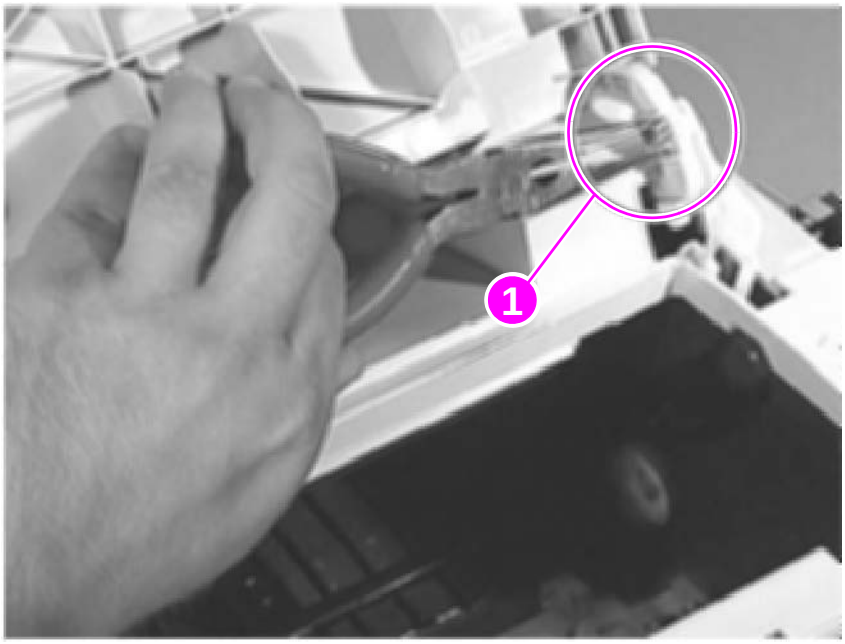

Figure 64. **Release door swing arm**

Step 3 Remove the top-cover mounting screws (callout 1).

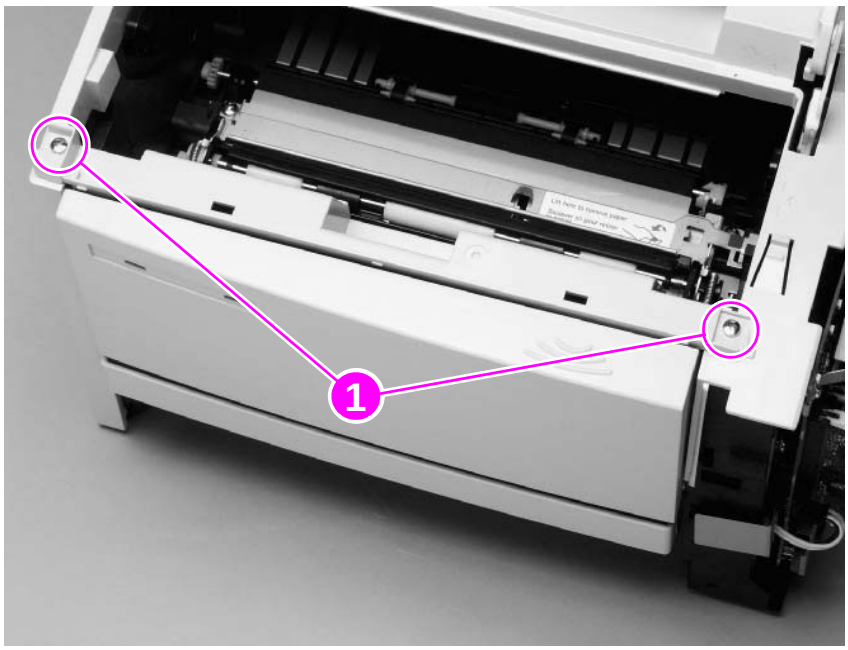

Figure 65. **Remove mounting screws**

Step 4 With the rear of the printer facing forward as shown, remove the top-cover mounting screws (callout 1).

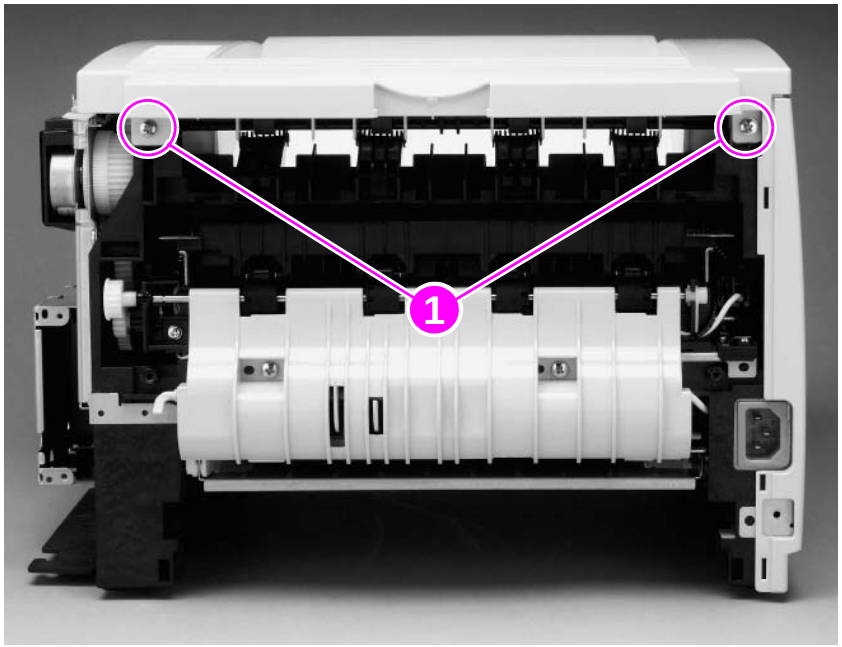

Figure 66. **Remove mounting screws**

Step 5 Open the tray 1 door.

Step 6 Release the two top cover tabs (callout 1) located on either side of the toner door.

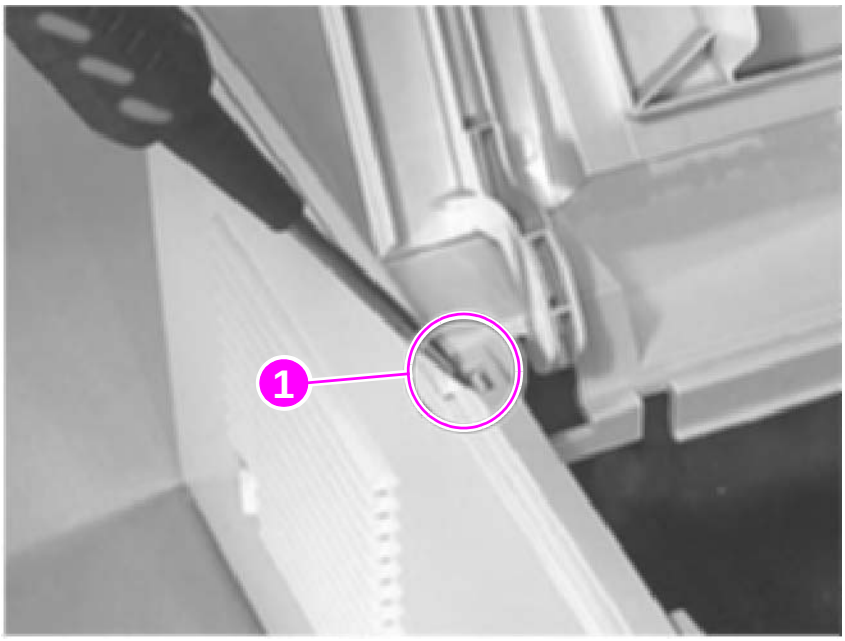

Figure 67. **Release top cover tabs (left tab shown)**

Step 7 Lift the cover up and off the printer.

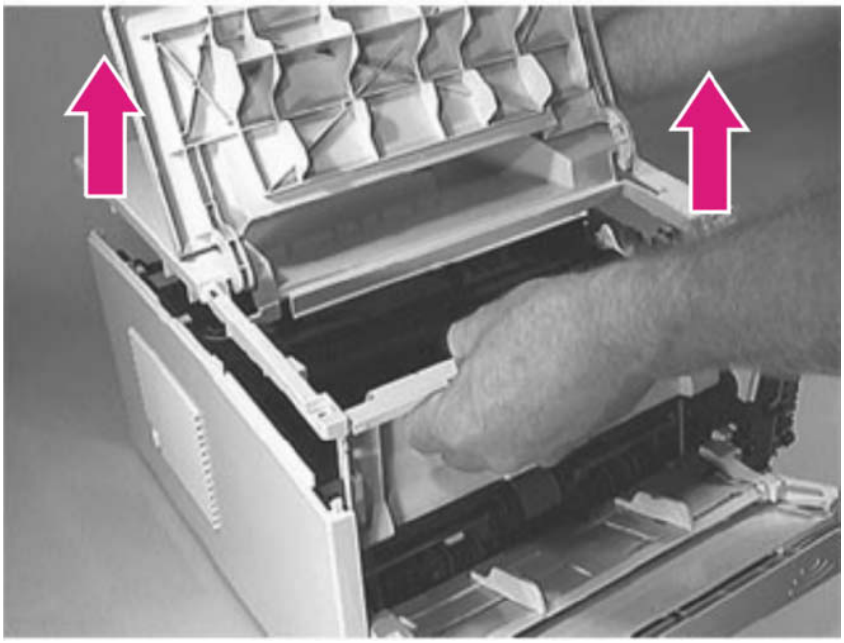

Figure 68. **Remove top cover**

CAUTION When replacing the top cover, make sure the drive release lever is attached to the swing arm.

Note When replacing the top cover, use the longer of the four mounting screws in the mounting screw-holes located under the toner door.

Remove left cover

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.

Step 2 Release the top latch (callout 1) and lower-front corner locking tab (callout 2).

Step 3 Lift off the cover.

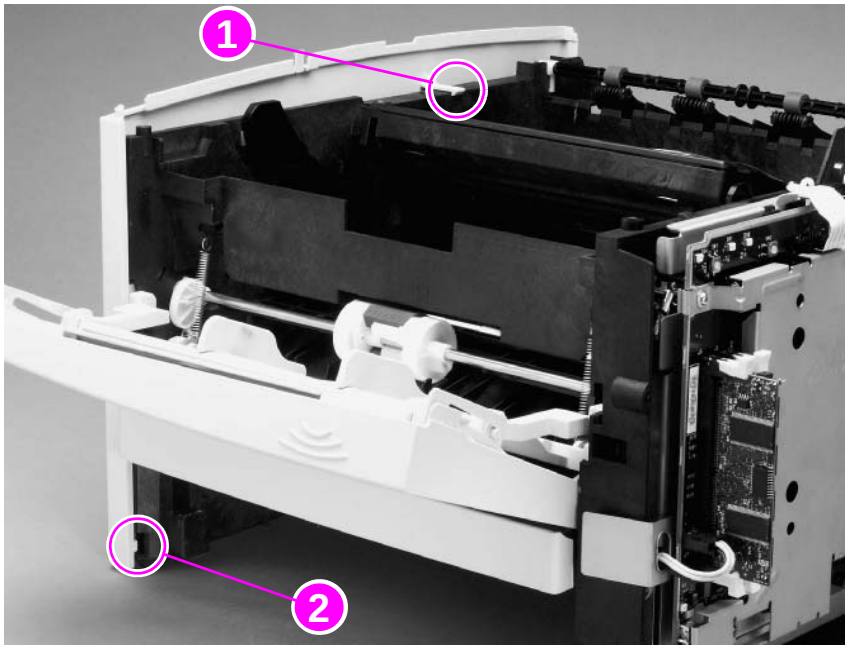

Figure 69. **Release left cover latches**

Remove tray 1

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.

Step 2 Disconnect the springs (callout 1) from the tray 1 support arms.

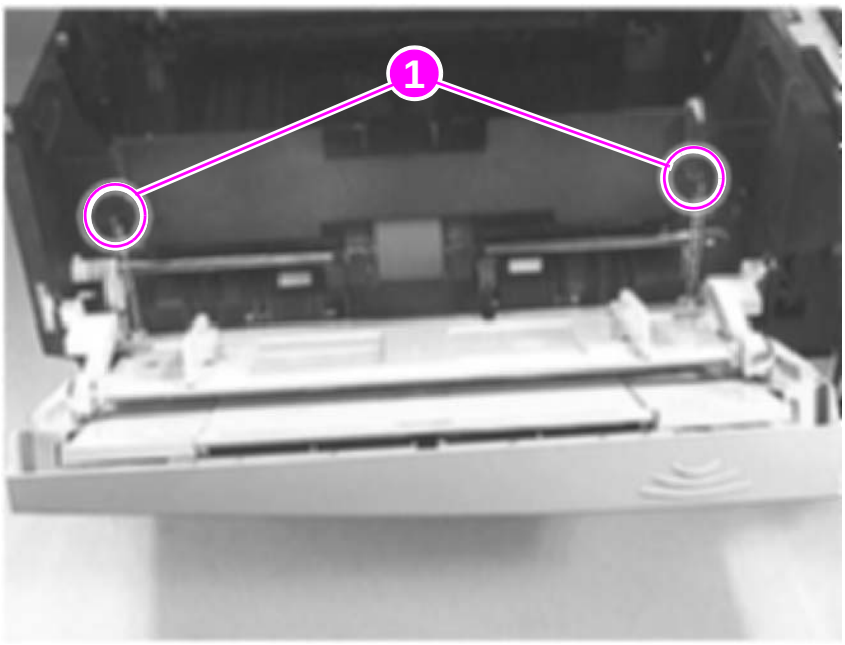

Figure 70. **Disconnect tray 1 support springs**

Step 3 Disconnect the pivot arms (callout 1).

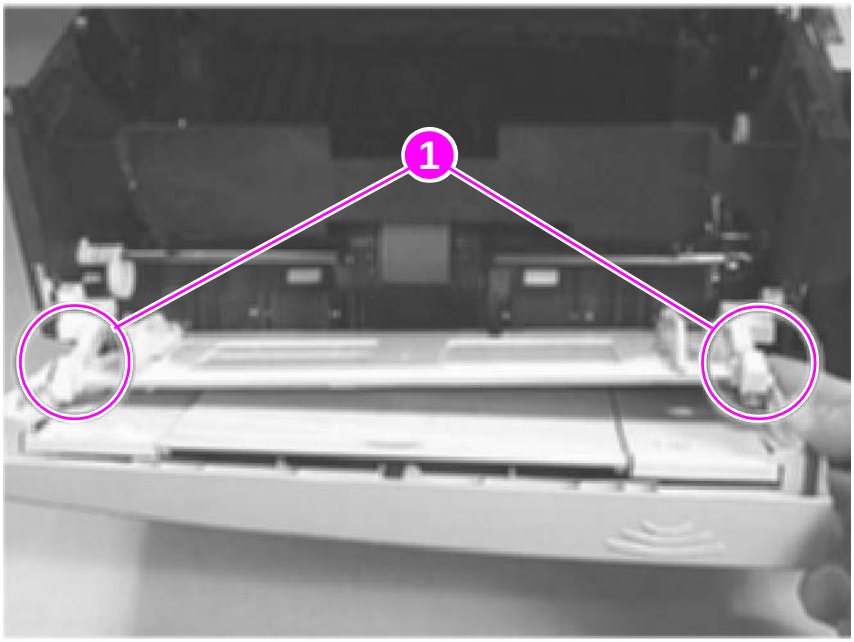

Figure 71. **Disconnect tray 1 pivot arms**

Step 4 Slide the tray 1 door toward the fan and away from the printer.

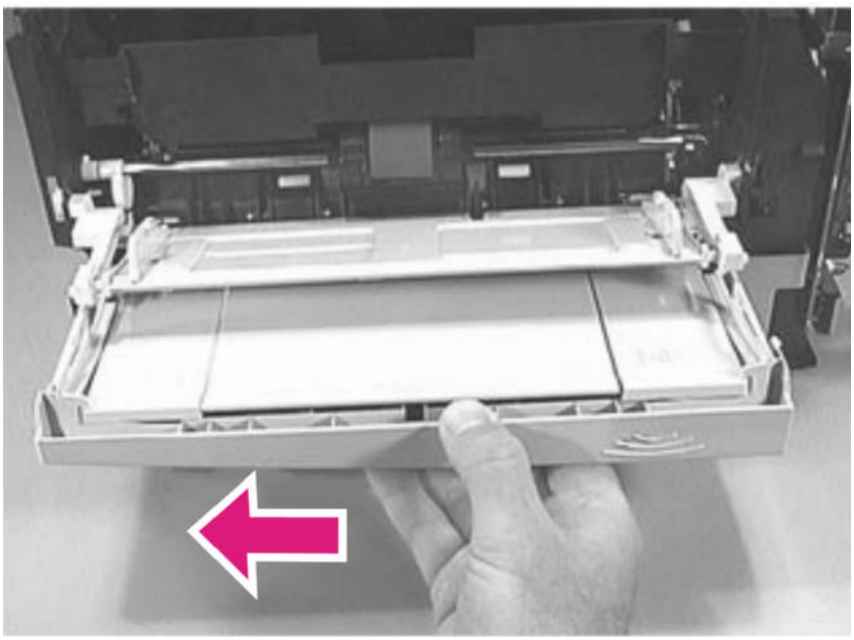

Figure 72. **Remove tray 1 door**

Step 5 Disconnect the pivot arms (callout 1) from the tray 1 shelf and rotate them to the vertical position.

Step 6 Remove the tray 1 shelf.

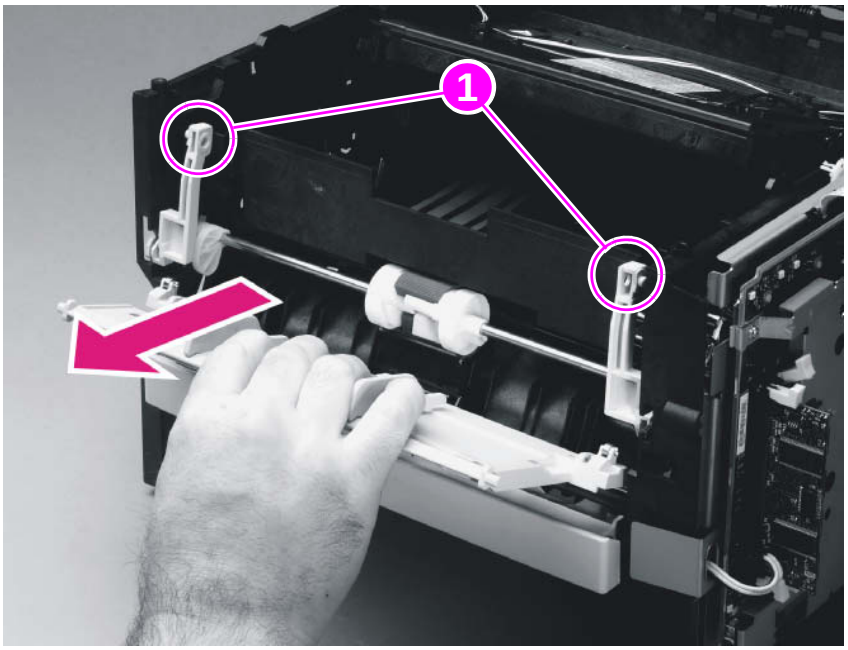

Figure 73. **Disconnect pivot arms from tray 1 shelf**

Step 7 Rotate the pivot arms downward and remove them from the tray.

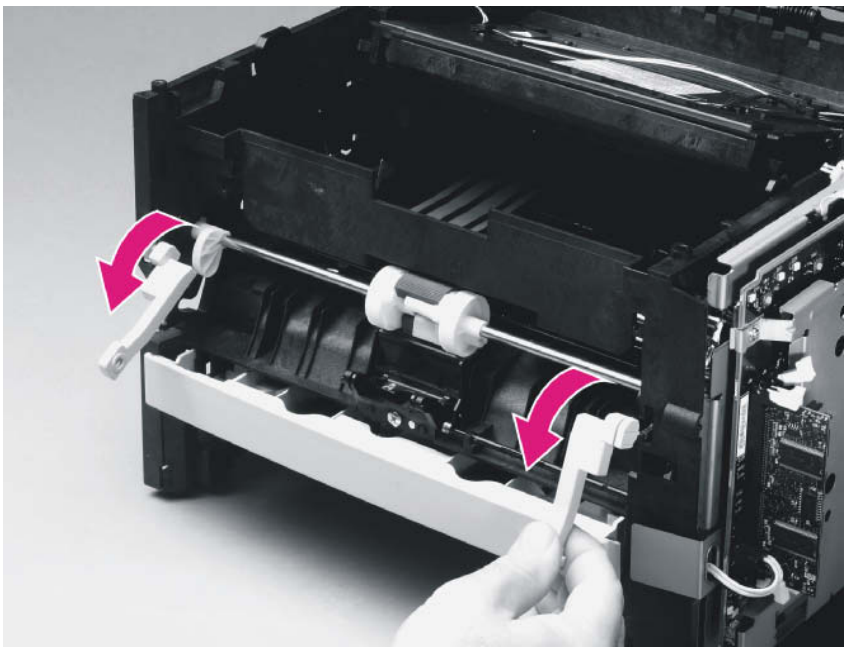

Figure 74. **Remove pivot arms**

Note Pivot arms are not interchangeable. When replacing the pivot arms, verify that the right pivot arm (marked R) and left pivot arm (marked L) are correctly installed.

Remove transfer roller

CAUTION Do not touch the surface of the transfer roller with bare hands. Skin oils can damage the roller. Instead, grasp the bushing and shaft.

Step 1 Open the toner cartridge door.

Step 2 Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.

Step 3 Locate the black bushing on the left end of the transfer roller shaft and just behind the gear.

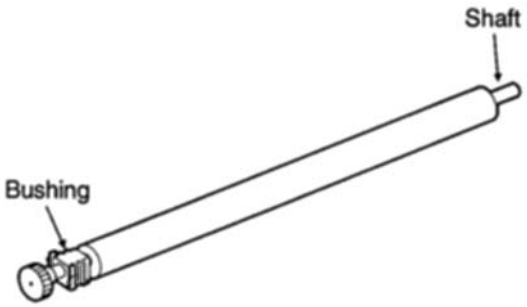

Figure 75. **Transfer roller black bushing**

Step 4 Squeeze both of the locking tabs on the black bushing, then slightly lift the gear end of the transfer roller. Slide the roller left until the shaft clears the white bushing.

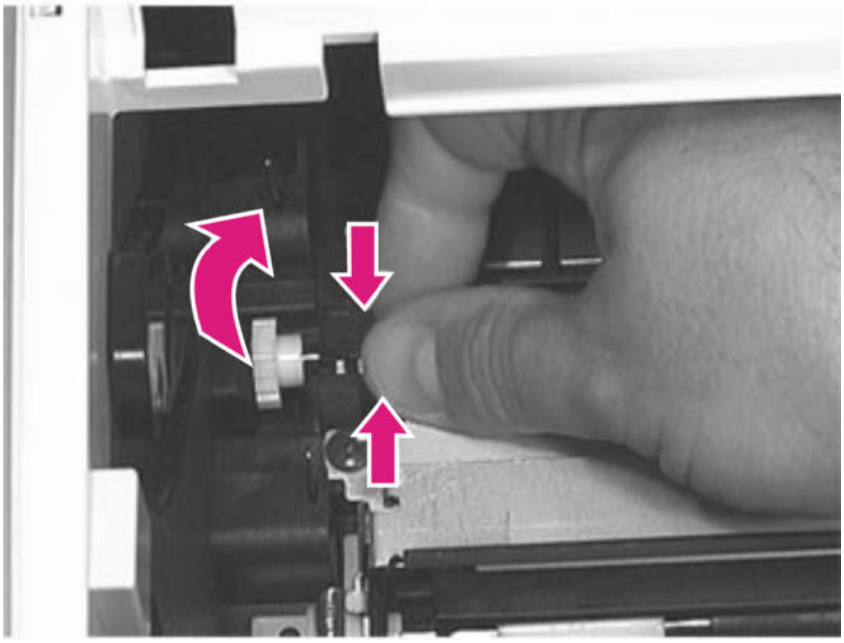

Figure 76. **Removing the transfer roller**

Step 5 Squeeze both of the locking tabs on the white bushing and slide the bushing out of its mounting slot.

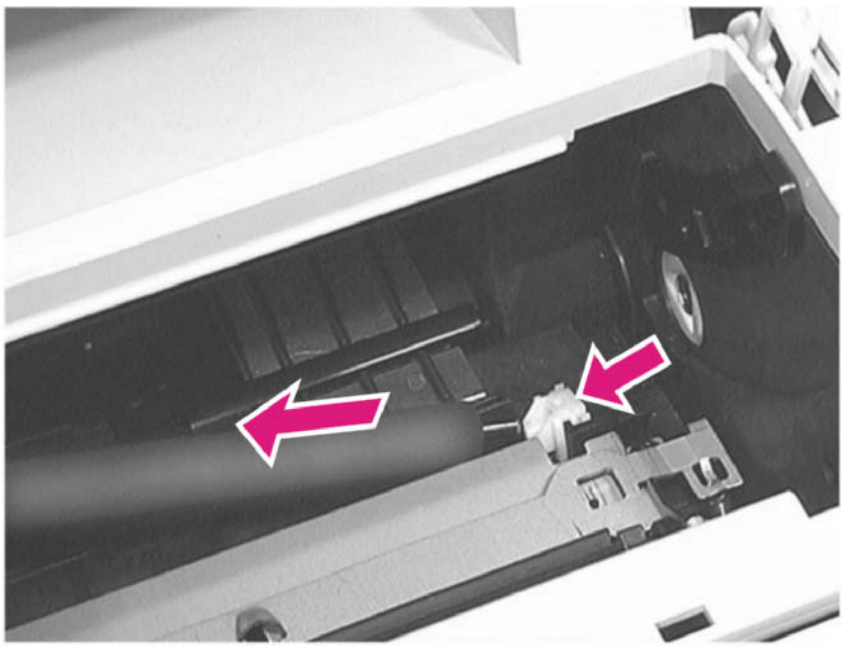

Figure 77. **Remove the white bushing**

Remove DIMM

Step 1 Remove the DIMM cover. See “Remove DIMM cover” on page 99.

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Rotate the DIMM socket release levers (callout 1) outward.

Step 3 Pull DIMM out of socket.

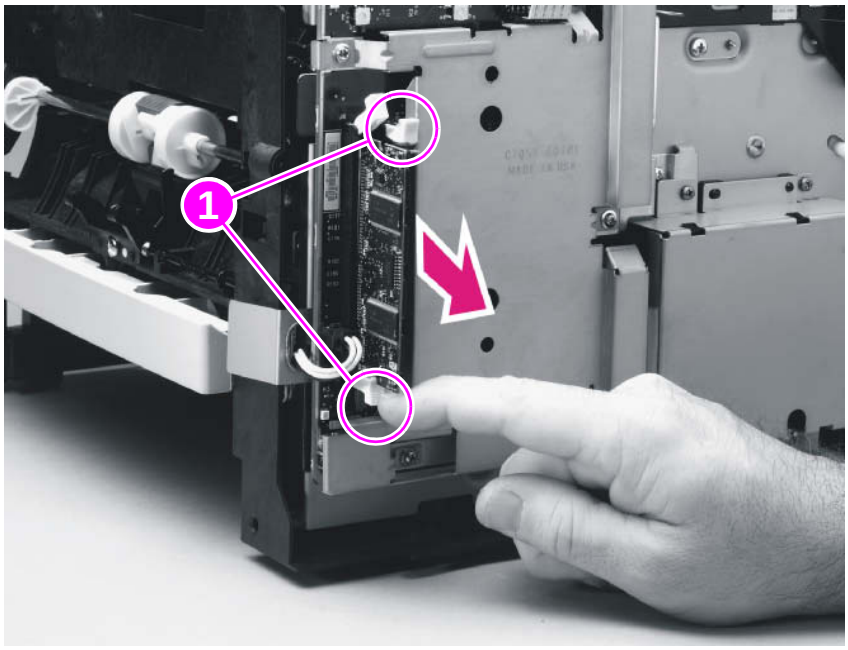

Figure 78. Remove DIMM

Remove formatter PCB

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the EIO card (if installed). See “Remove I/O cover” on page 98.

Step 2 Disconnect the ribbon and power cable (callout 1) and remove the five mounting screws (callout 2) that secure the PCB and shield to the printer drive assembly.

Step 3 Lift off the formatter PCB and shield.

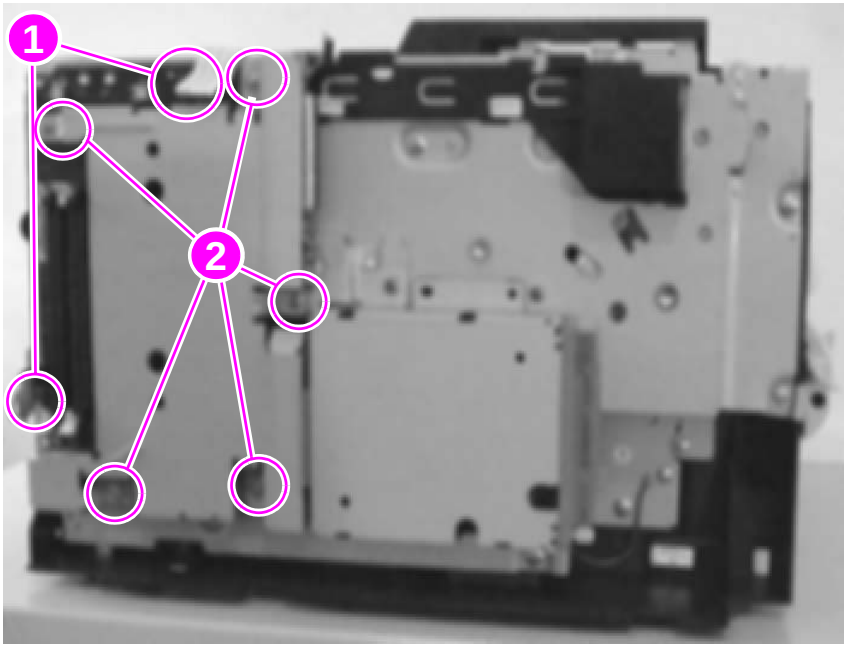

Figure 79. **Remove formatter PCB**

Remove EIO shield and guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.

Step 2 Remove the four screws (callout 1) that secure the shield to the printer drive assembly.

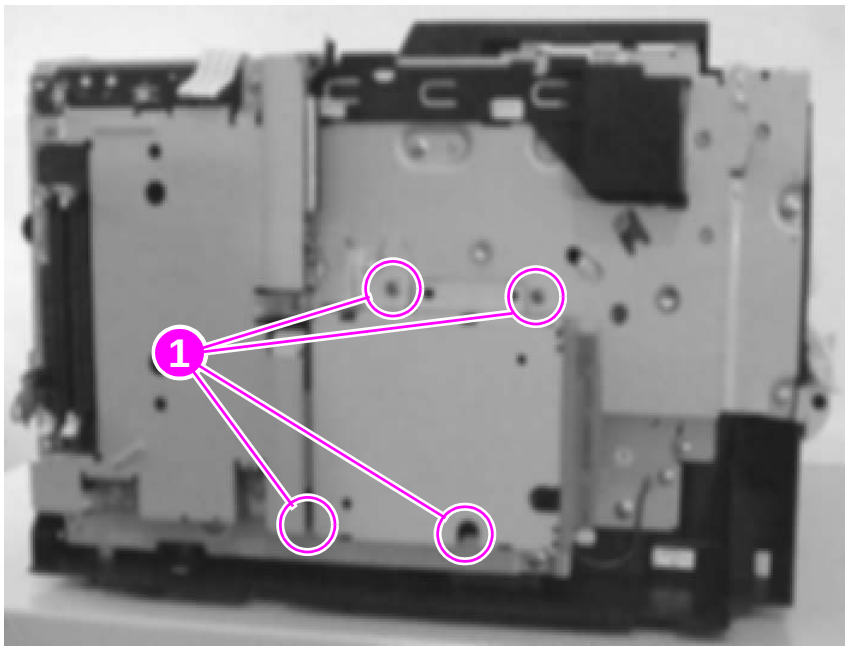

Figure 80. **Remove EIO shield**

Remove fuser assembly

CAUTION If the printer was recently operating, verify that the fuser assembly has sufficiently cooled before handling.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.

Step 2 Remove the two screws (callout 1) that secure the reverse guide to the fuser assembly and lift the guide off.

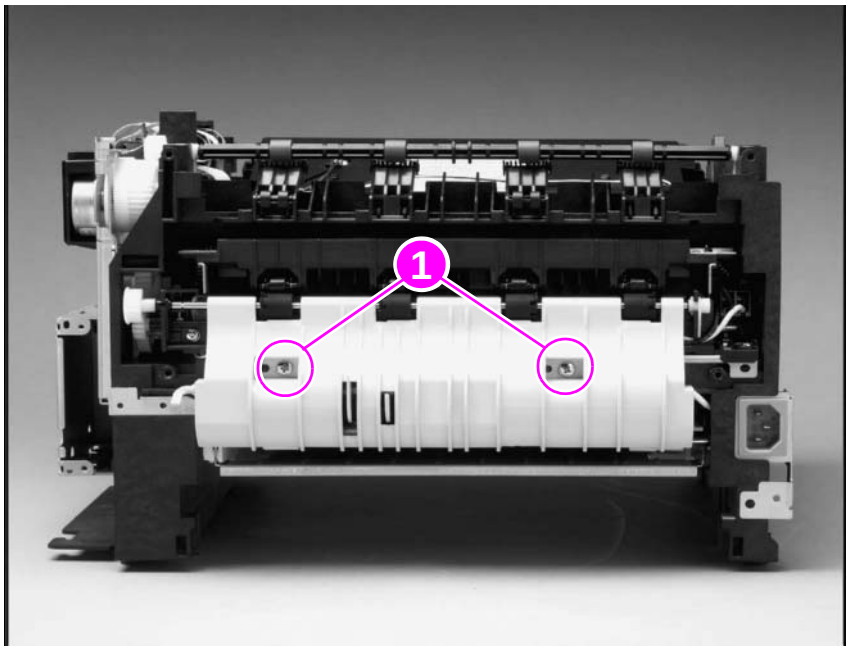

Figure 81. **Fuser assembly (under the reverse guide)**

CAUTION When replacing the reverse guide, use the two screws (callout 1) removed in step 2. These screws allow the cover to expand and contract when the fuser assembly heats up or cools down.

Step 3 Unplug the two-pin, three-pin, and five-pin wire harness connectors (callout 1).

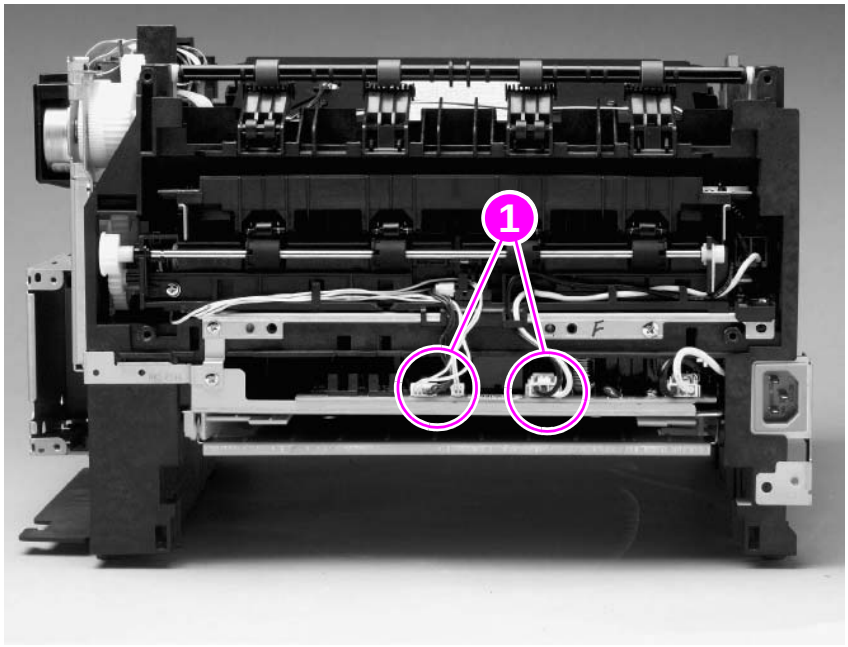

Figure 82. **Unplug wire harness connectors**

Step 4 Remove one grounding screw (callout 1) that secures the fuser assembly to the printer.

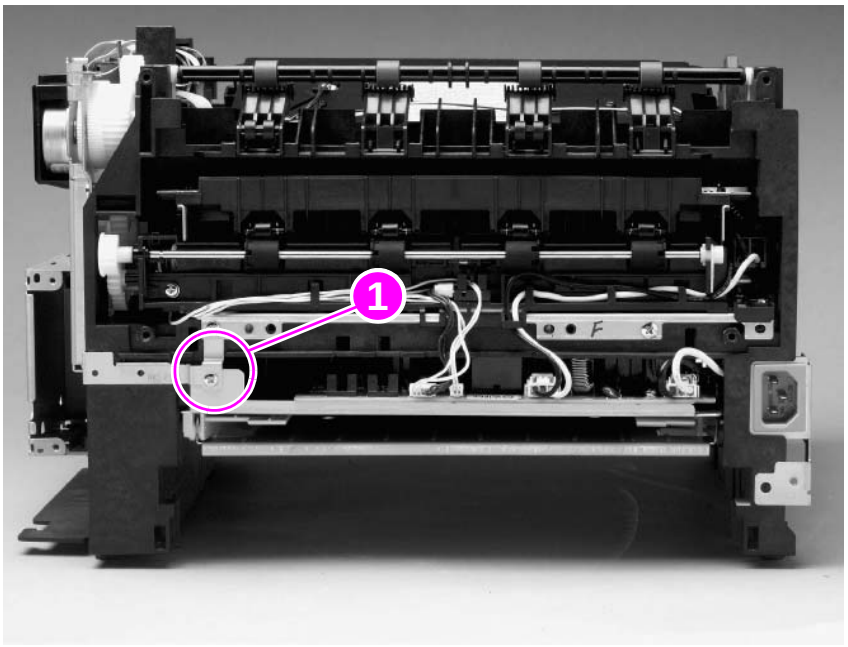

Figure 83. **Remove mounting screws**

Step 5 Pull the fuser assembly from the printer.

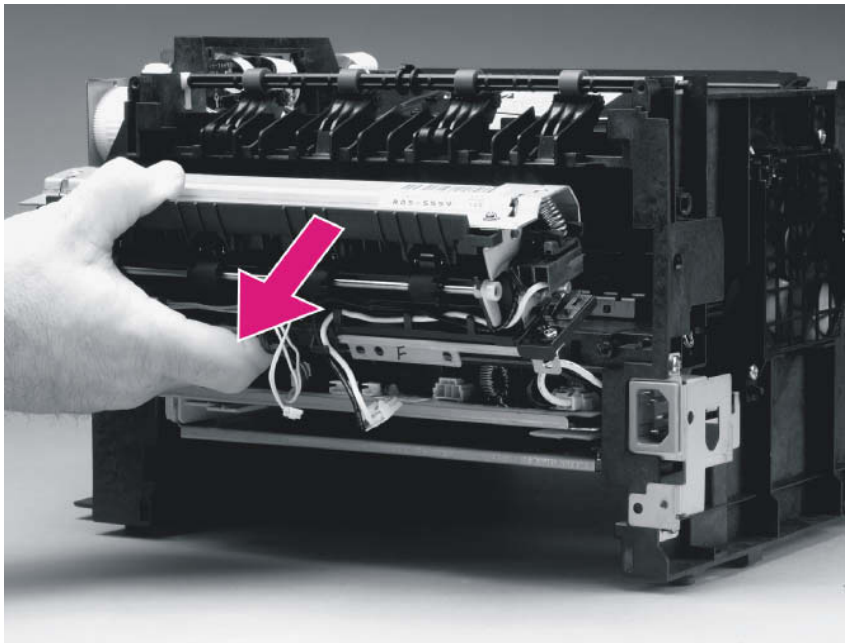

Figure 84. **Remove fuser assembly**

Note When replacing the fuser assembly, use the guide pins (located near the mounting screw-holes) to correctly align it.

Remove fuser-film heater assembly

Step 1 Remove the fuser assembly. See “Remove fuser assembly” on page 114.

Step 2 Disconnect the wire connector (callout 1) and remove the right and left wire harnesses from the retainer clips (callout 2).

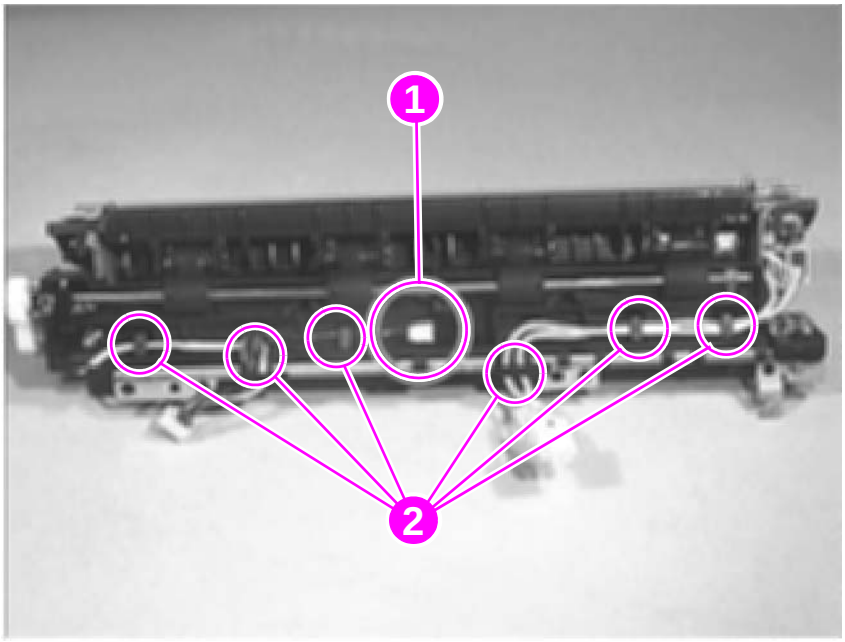

Figure 85. **Unplug fuser-film heater assembly wire harness**

Step 3 Remove the two pressure plate screws (callout 1).

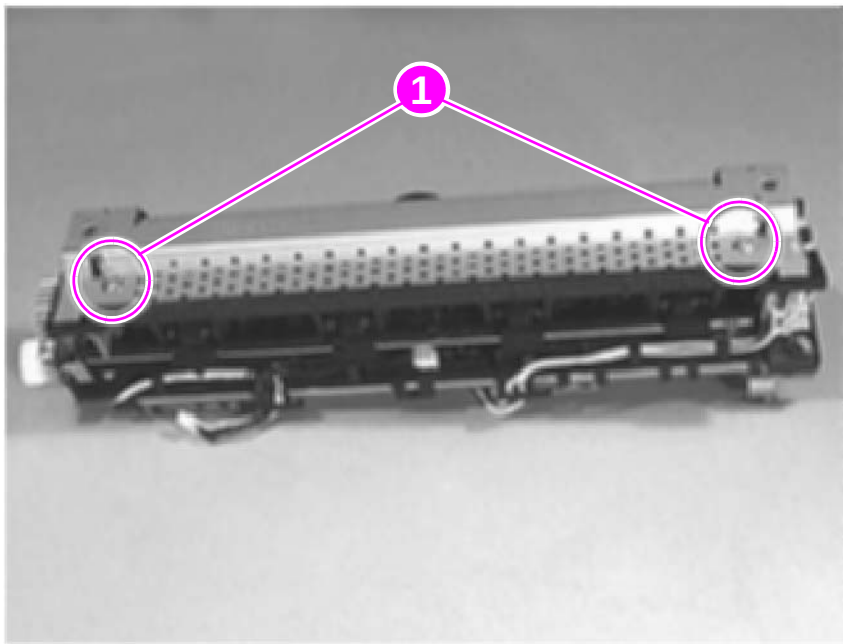

Figure 86. **Remove pressure plate screws**

CAUTION The pressure plate is spring-loaded. Exercise caution when removing the pressure plate.

Step 4 Use a small flatblade screwdriver to gently to detach the pressure plate retaining clips (callout 1).

Step 5 Lift off the pressure plate.

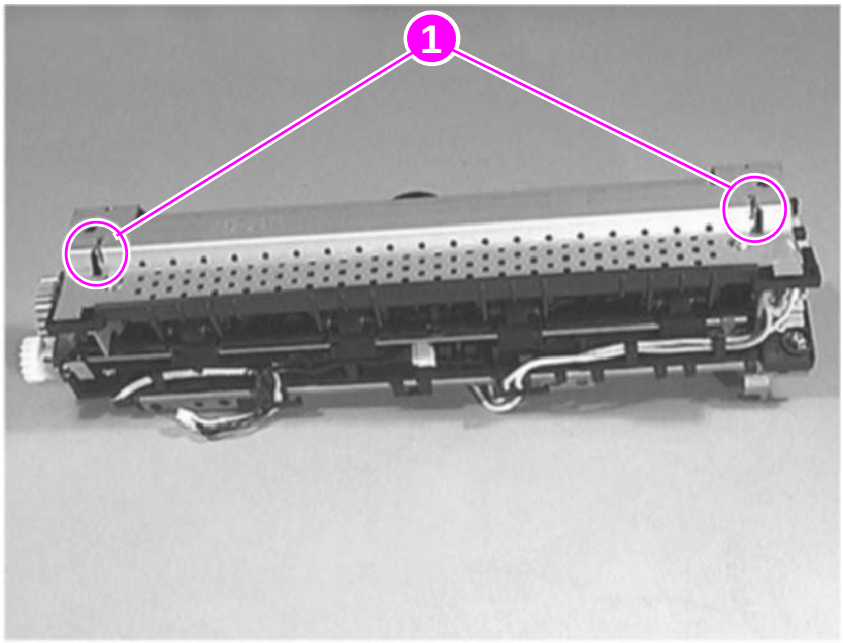

Figure 87. **Remove pressure plate**

Step 6 Lift the fuser-film heater assembly out of the assembly carriage.

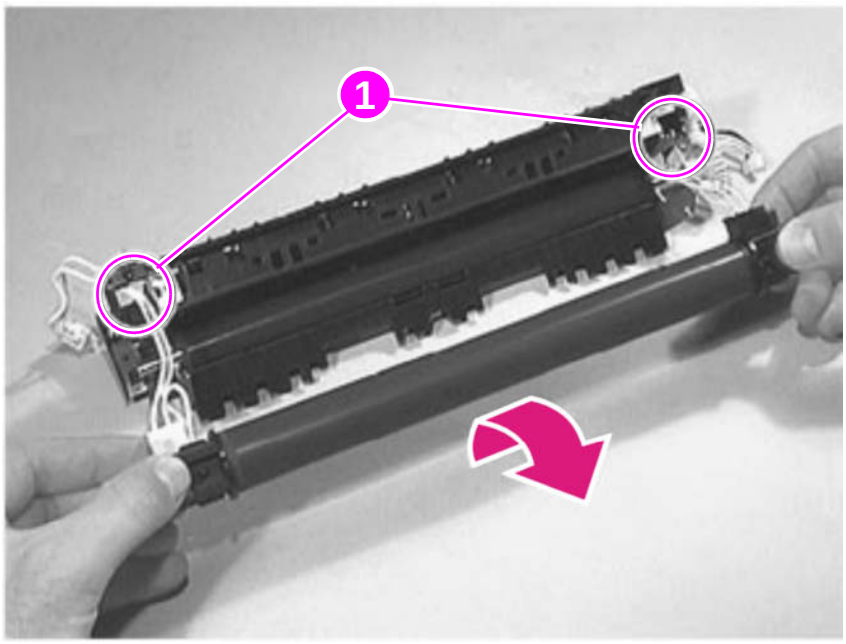

Figure 88. **Remove the fuser-film heater assembly**

Note When replacing the fuser-film heater assembly, verify that it is correctly oriented (callout 1). Position the end with the two-wire harness (black and white wire) is over the shaft end of the pressure roller.

Remove pressure roller

Step 1 Remove the following assemblies:

- Remove the fuser assembly. See “Remove fuser assembly” on page 114.
- Remove the fuser-film heater assembly. See “Remove fuser-film heater assembly” on page 117.

Step 2 Lift the pressure roller out of the assembly carriage.

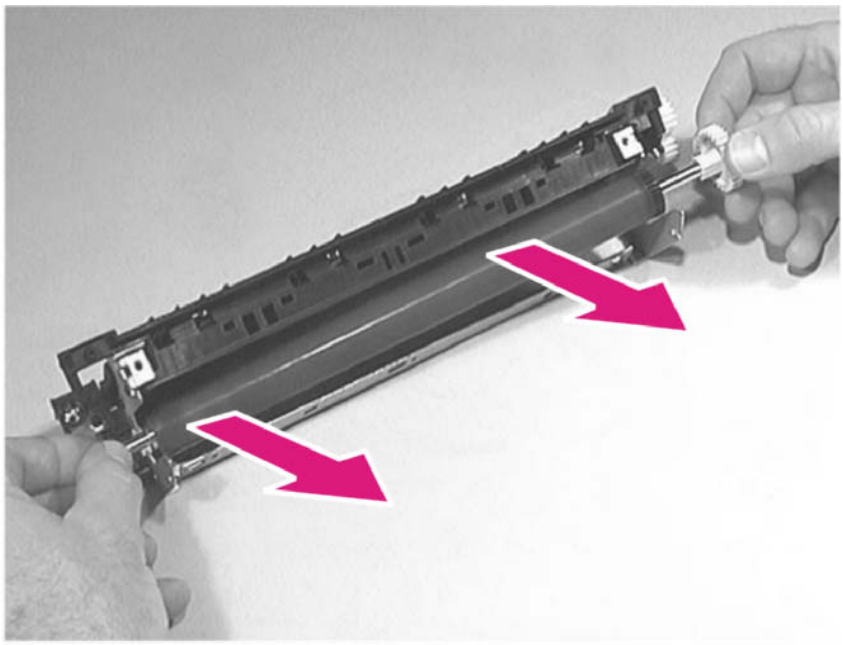

Figure 89. **Remove pressure roller**

Remove duplexer tray

CAUTION When picking up the printer with the rear cover removed, do not lift by holding the duplexer tray. Whenever possible, handle the printer by holding the sides to prevent damaging internal components.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.

Step 2 Turn the printer over, top down.

Step 3 Unsnap the locking lever of the pivot pin, rotate it to the vertical position, and remove it from the mounting hole.

Step 4 Pull the green duplexer release lever (callout 1) forward to release the duplexer tray.

Step 5 Slightly raise the duplexer tray until the stop spring (callout 2) makes contact with the chassis. Push the spring in until it clears the slot in the chassis. Raise the door to the vertical position.

Step 6 Raise the corner of the tray nearest the duplex media guide. Slide the tray toward the printer drive assembly.

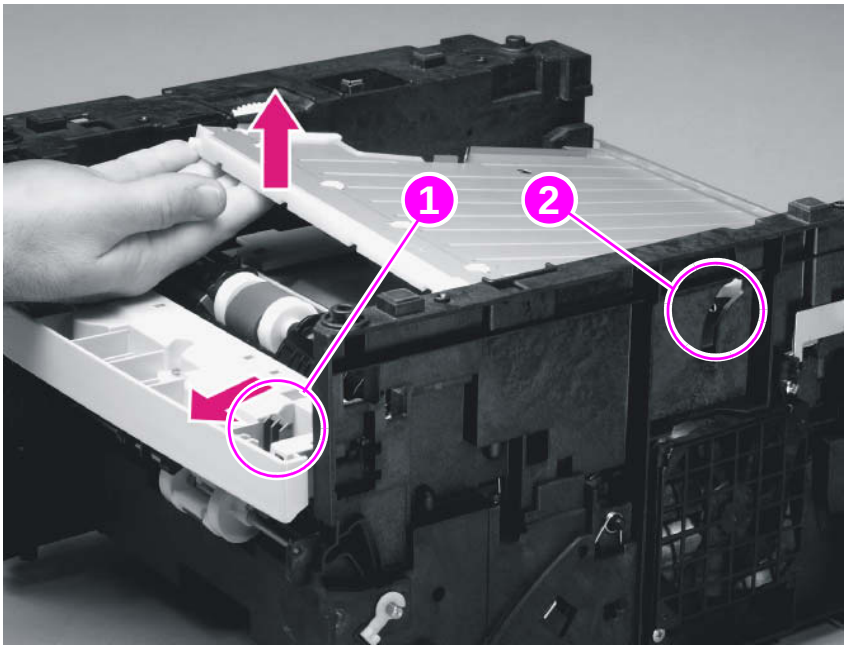

Figure 90. **Duplexer tray**

Note When replacing the duplexer tray, verify that the stop spring (callout 2) correctly extends into the provided slot in the chassis.

Remove duplexer media guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the duplexer tray. See “Remove duplexer tray” on page 120.

Step 2 Remove the two duplexer media guide mounting screws (callout 1). Lift off the duplexer media guide.

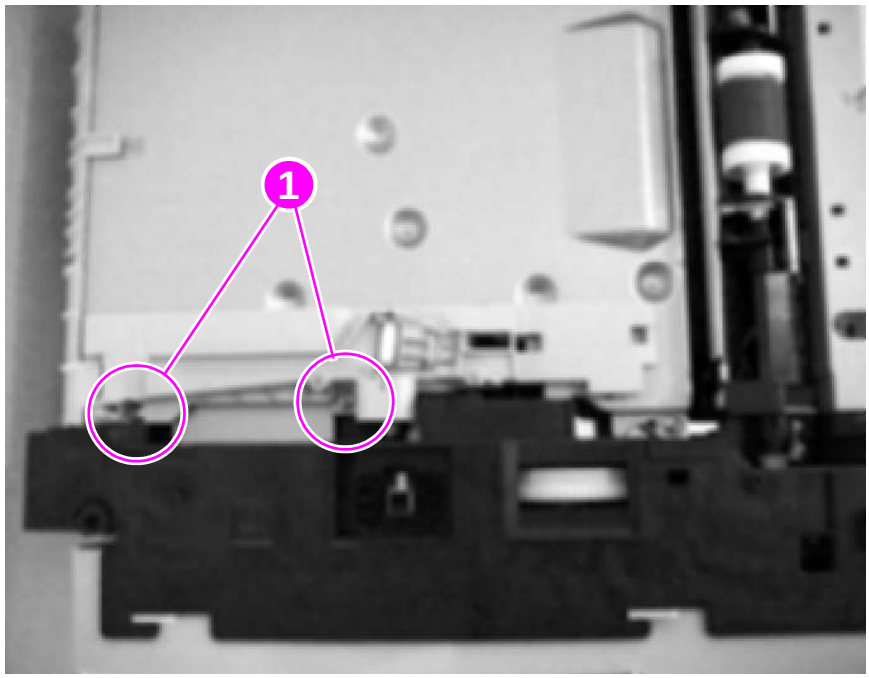

Figure 91. **Duplexer media guide**

Remove power supply assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the rear pivot pin, duplexer tray, and duplex media guide. See “Remove duplexer tray” on page 120.

Step 2 Remove the two mounting screws from the reverse guide and lift it off. See “Remove fuser assembly” on page 114.

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 3 Unplug two two-pin, a three-pin, and the five-pin harness connectors (callout 1).

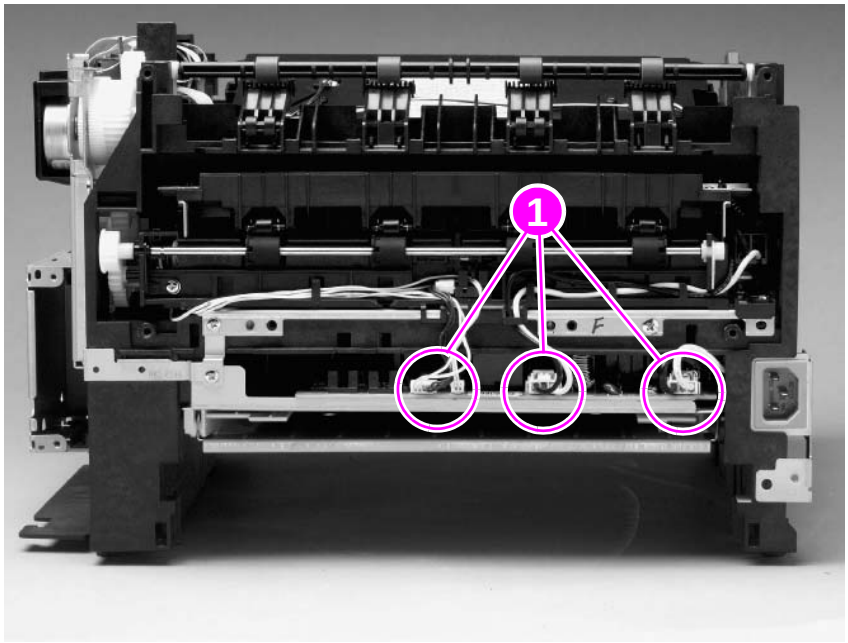

Figure 92. Unplug wire harness

Step 4 Place the printer top-down with the fuser assembly facing outward.

Step 5 Remove the three mounting screws (callout 1) and two ground screws (callout 2).

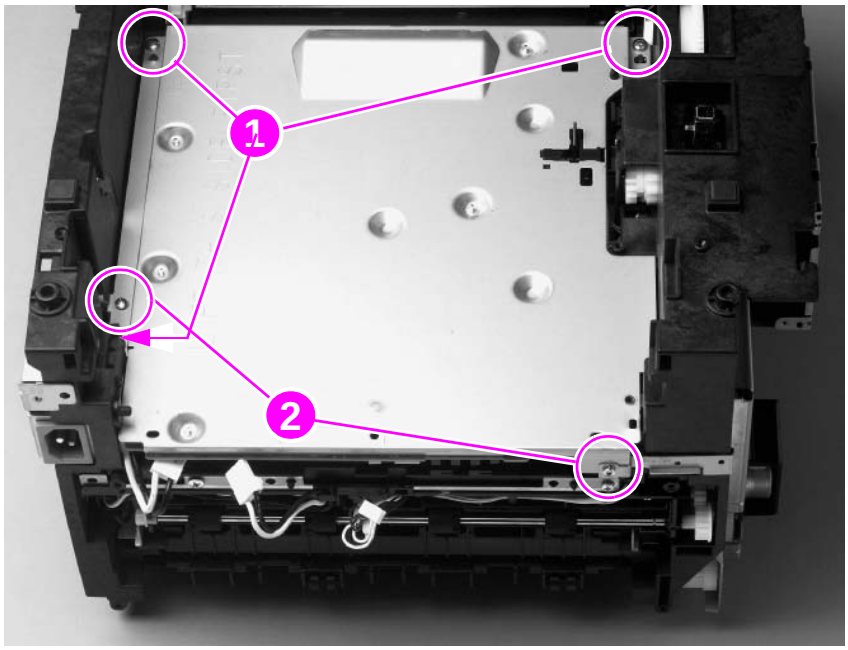

Figure 93. Remove power supply assembly screws

Step 6 Lift the side of the power supply assembly stamped “LIFT THIS SIDE FIRST” to expose assembly harnessing. The harness connectors attach to the right side of the engine power assembly.

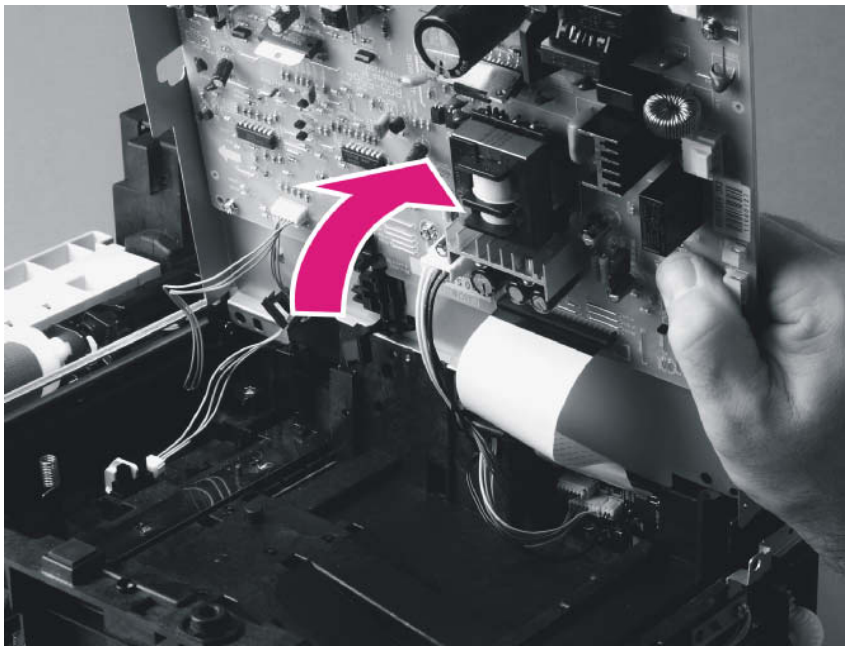

Figure 94. Expose the harness connectors assembly

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 7 Unplug the formatter ribbon cable (callout 1), four-pin motor power harness (callout 2), and the six-pin refeeder harness (callout 3). Unlace harness as required (callout 4).

Step 8 Lift off the power-supply assembly.

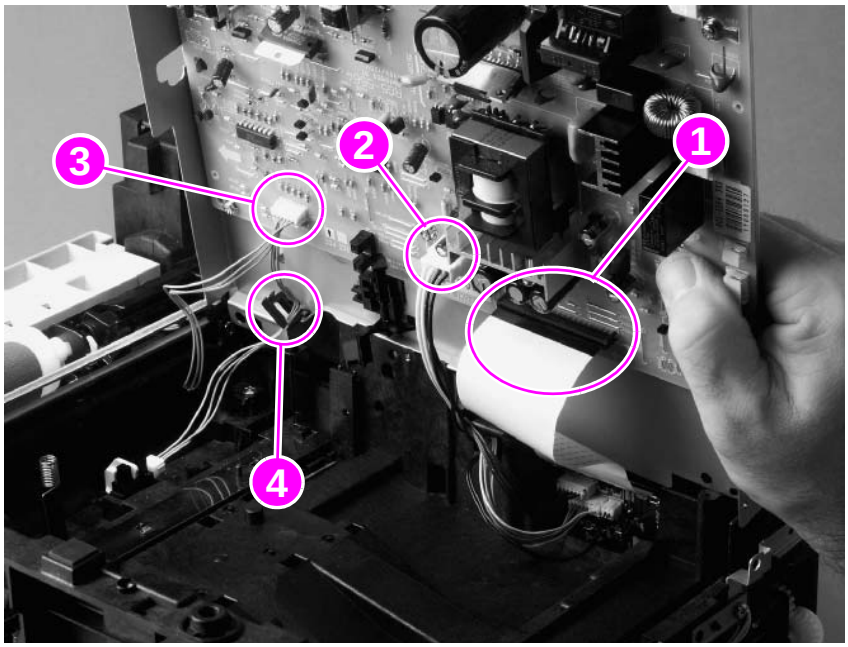

Figure 95. **Unplug harness connectors**

Note When replacing the power-supply assembly, verify that the refeeder harness is clipped to the wire clip (callout 4) to prevent it from interfering with other internal components.

Remove upper output delivery roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.

Step 2 Release both clips on the roller, geared end first.

Step 3 Lift off the upper output delivery roller.

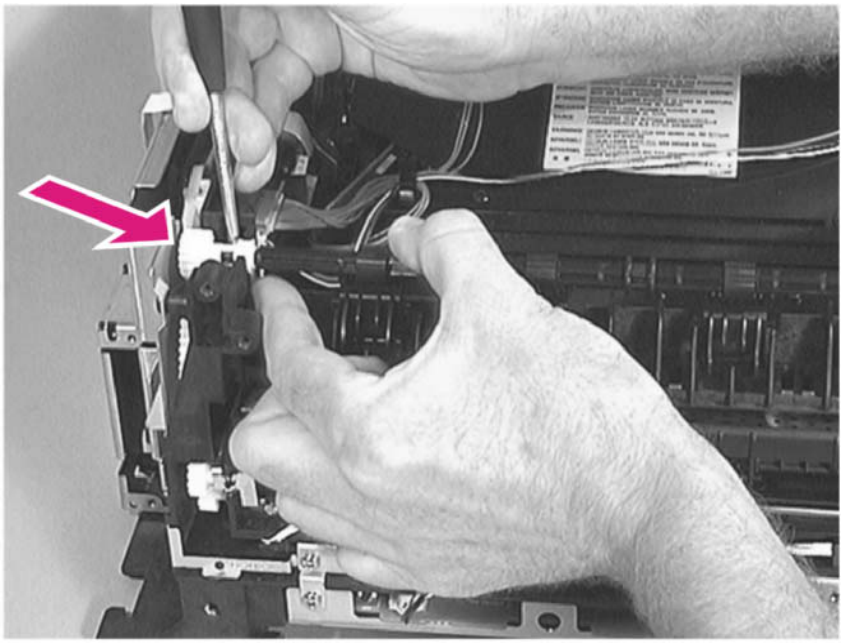

Figure 96. **Remove upper output roller**

Disassemble the upper output delivery roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove the upper output delivery roller. See “Remove upper output delivery roller” on page 125.

Step 2 Remove the gear (callout 1) from the roller.

Step 3 Remove the clips (callout 2) from the roller.

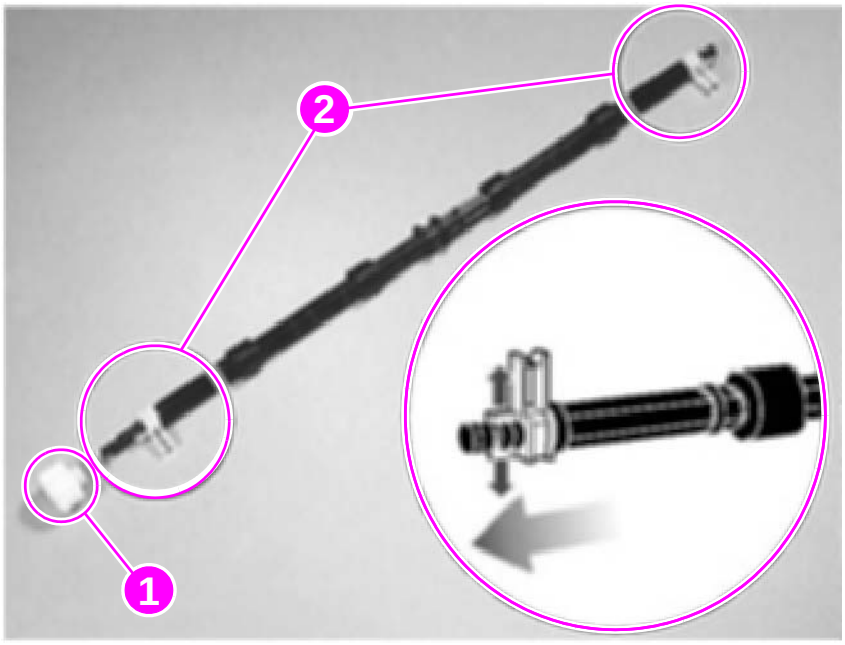

Figure 97. **Remove gear and clips**

Remove lower output delivery rollers

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove the upper output delivery roller. See “Remove upper output delivery roller” on page 125.

Step 2 Rotate the rollers (callout 1) up to the vertical position (away from the laser/scanner), to unseat the roller spring.

Step 3 Push down to disengage the pivot pins of the rollers.

Step 4 Lift out the rollers.

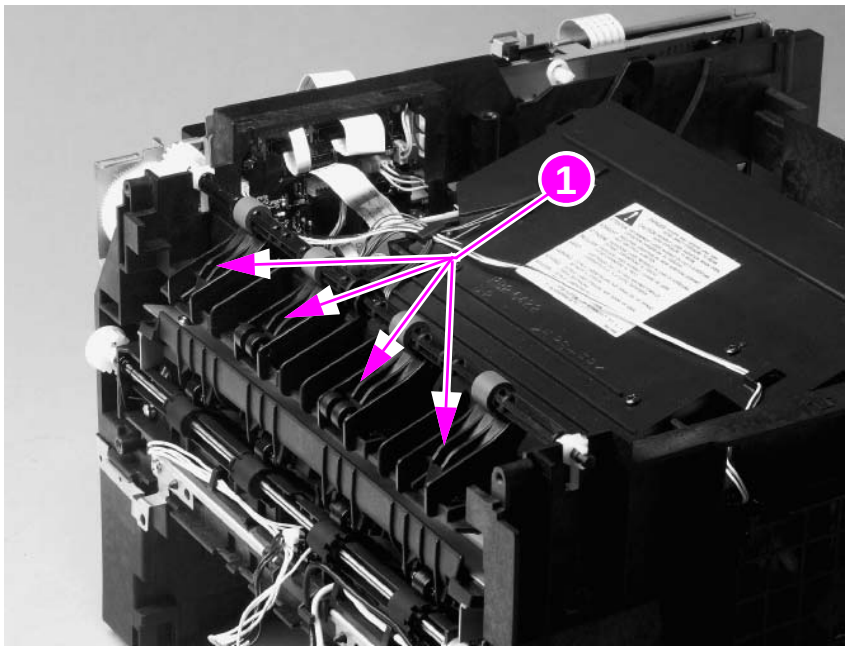

Figure 98. **Remove lower output delivery rollers**

Note When replacing the lower output delivery rollers (callout 1), remove the roller springs for use with the new rollers.

CAUTION When installing the lower output delivery rollers (callout 1), verify that the two middle rollers are equipped with the additional lower wheels.

Remove laser/scanner assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Unplug the seven-pin scanner harness (callout 1), scanner ribbon cable (callout 1), and the two-pin fan harness (callout 2).

Step 3 Unlace the two-pin fan harness (callout 3) from the wire clips on the scanner.

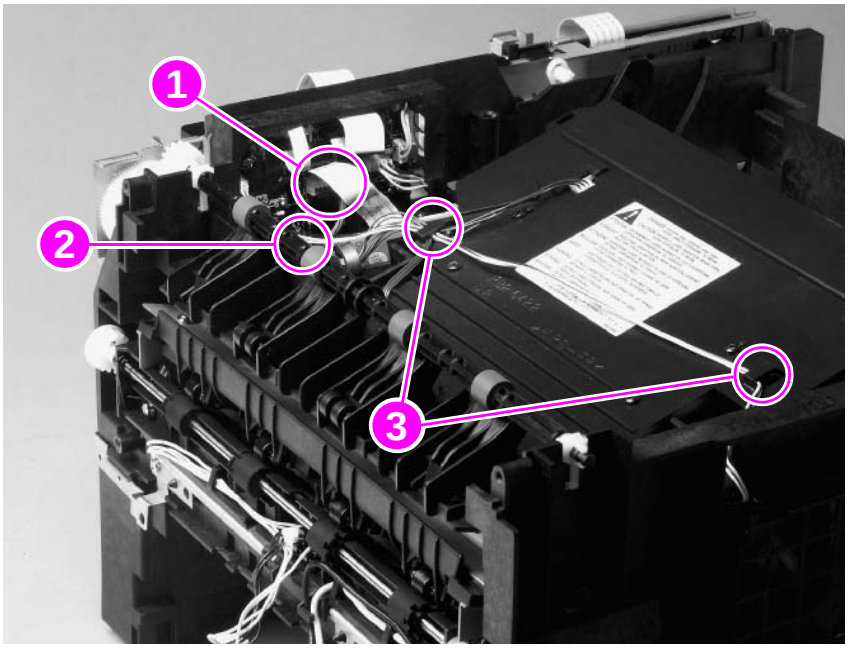

Figure 99. Unplug harness connectors

Step 4 Remove the four mounting screws (callout 1).

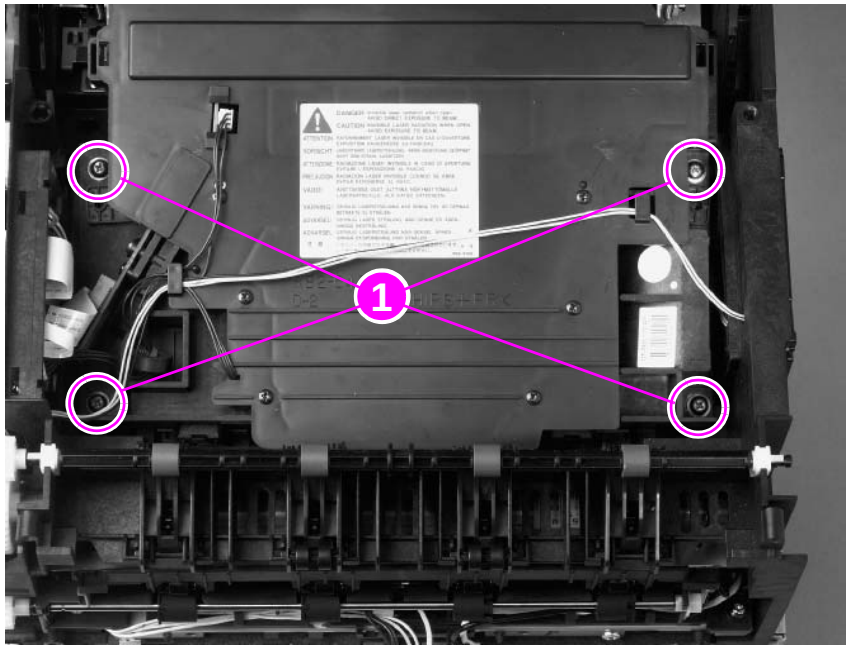

Figure 100. **Remove the laser/scanner assembly mount screws**

Step 5 Lift the laser/scanner assembly out of the chassis.

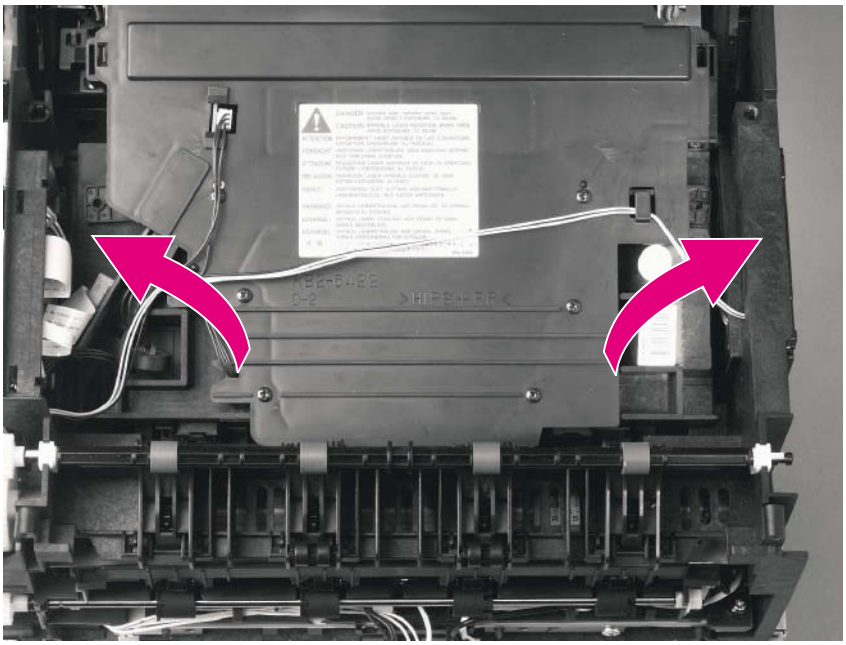

Figure 101. **Remove the laser/scanner assembly**

CAUTION When replacing the scanner assembly, verify that the locator pins on the assembly are properly seated. Failure to fully seat the locator pins can result in damage to the scanner assembly mounting surfaces when the mounting screws are tightened down.

Note When replacing the scanner assembly, verify that the torrid ring on the seven-pin scanner harness is fully recessed into the provided well to prevent it from interfering with other internal components.

Remove transport belts and rollers

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the laser/scanner assembly. See “Remove laser/scanner assembly” on page 128.

Step 2 Remove the roller assembly screw (callout 1).

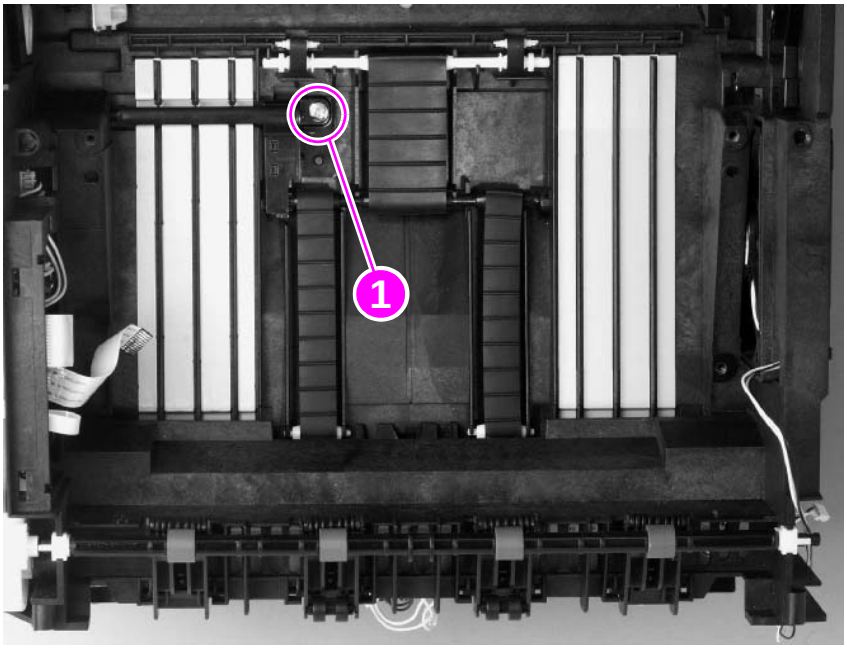

Figure 102. **Remove transport roller assembly screw**

Step 3 Lift up on the gear end of the middle roller until its shaft clears the hole in the gear assembly (callout 1).

Step 4 Slide the roller out of the mounting post (end with no gears).

Step 5 Lift out the middle roller.

Step 6 Lift out the remaining belts and rollers.

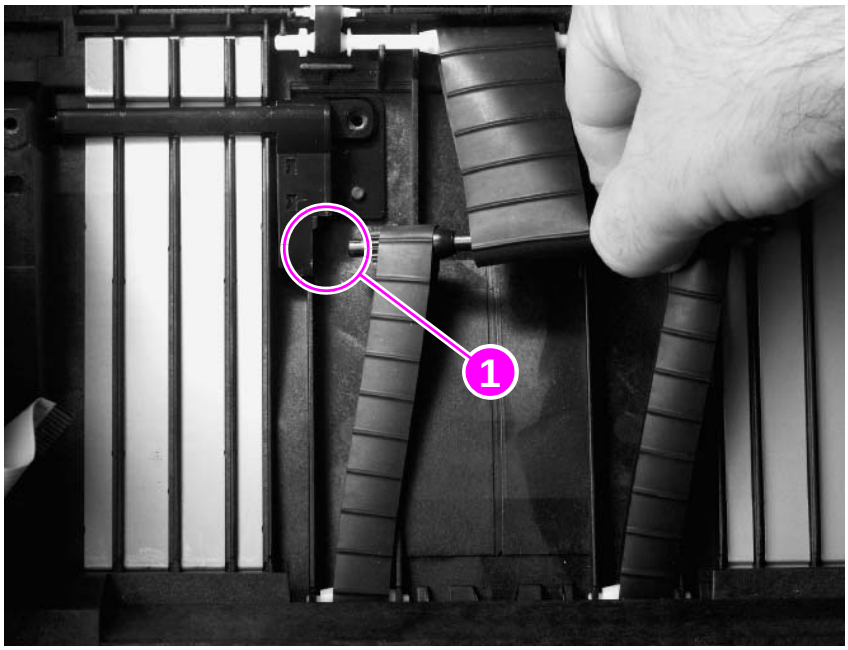

Figure 103. Remove center roller

Step 7 Verify the correct installation of the transport belts and rollers, using figure 104.

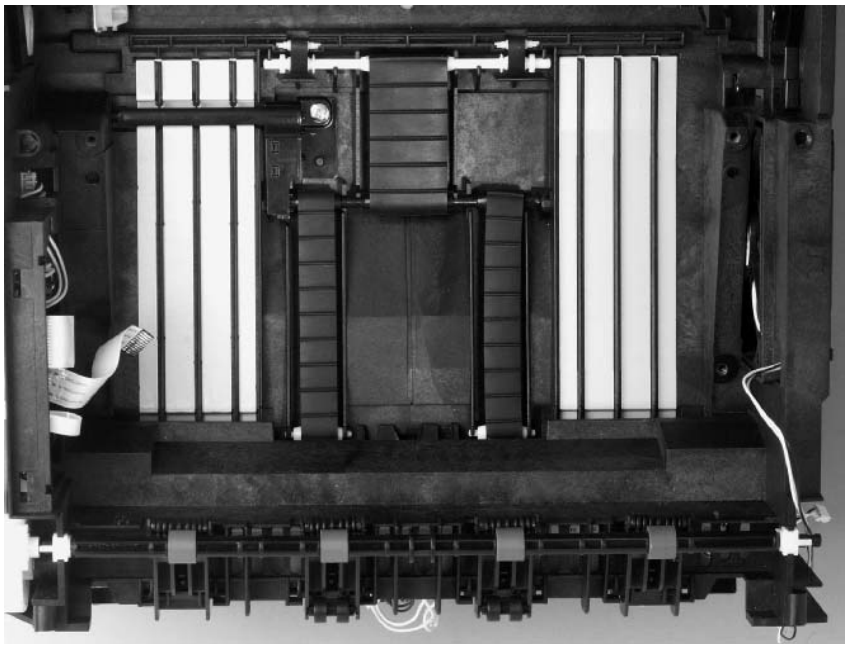

Figure 104. Transport rollers and belts installed

Remove ribbon cable harness

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.

Step 2 Unplug the two ribbon cables (callout 1).

Step 3 Feed the cables through the opening towards the harness cover.

Step 4 Lift the harness cover locking tab away from the printer chassis and slide the cover away from the duplexer reverse motor.

Step 5 Lift off the harness and cover.

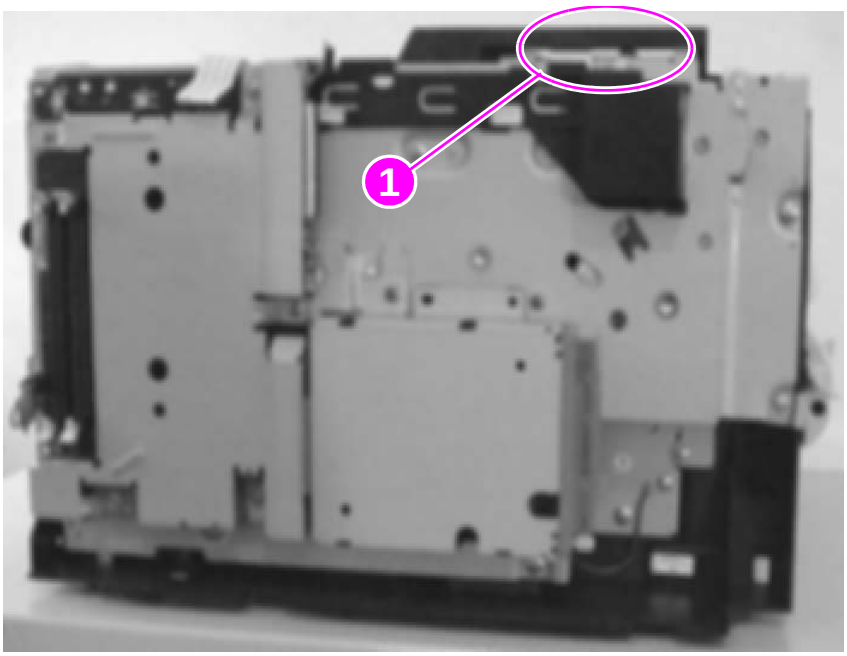

Figure 105. **Unplug the ribbon cables**

Note When installing the ribbon cable harness (callout 1), feed the cables through the opening in the chassis.

Remove duplexer reverse motor

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the ribbon cable harness. See “Remove ribbon cable harness” on page 132.

Step 2 Remove the two duplexer reverse motor mounting screws (callout 1).

Step 3 Lift off the motor.

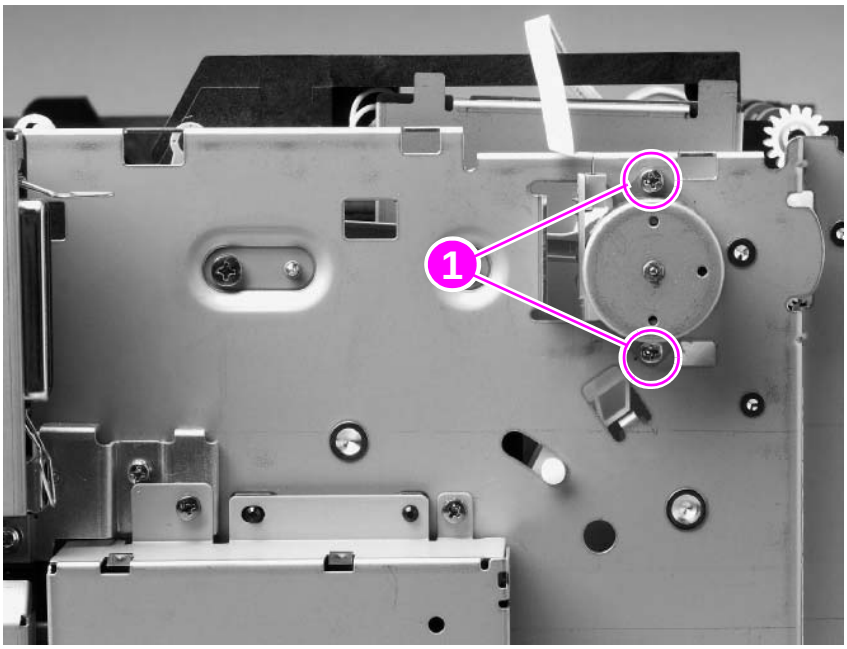

Figure 106. Remove duplexer reverse motor

Remove printer drive assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 132.

Step 2 Remove the five self-tapping mounting screws (callout 1) and three ground screws (callout 2).

Step 3 Tilt the printer drive assembly away from the chassis and unplug all harness connectors and the I/F ribbon cable.

Step 4 Lift off the printer drive assembly.

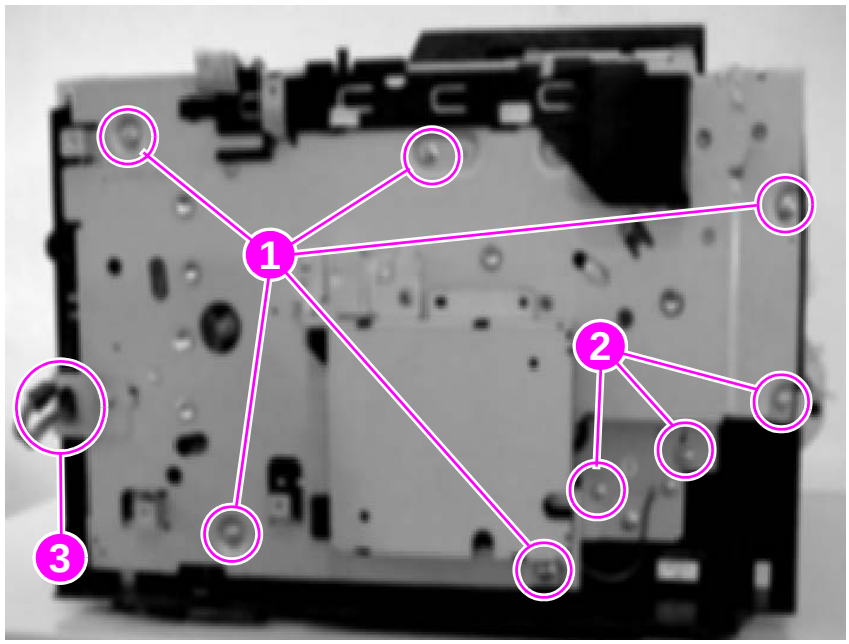

Figure 107. **Remove mounting and ground screws**

Note When replacing the printer drive assembly, feed the formatter power harness (callout 3) though the shield.

Remove engine controller assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 132.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

CAUTION The printer contains parts that are sensitive to electrostatic discharge (ESD). Always service the printer at an ESD-protected workstation or use an ESD mat.

Step 2 Remove the single mounting screw (callout 1) and ground cable screw (callout 2), and unplug the harness connector (callout 3).

Step 3 Lift off the engine controller assembly.

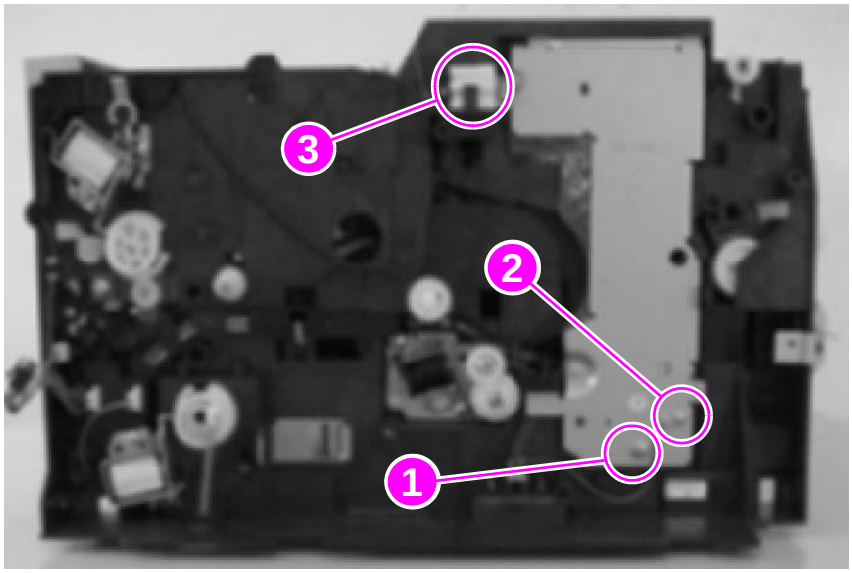

Figure 108. Remove mounting screw (shown from threaded side)

Remove main motor

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 132.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Remove the three mounting screws (callout 1).

Step 3 Lift off the main motor.

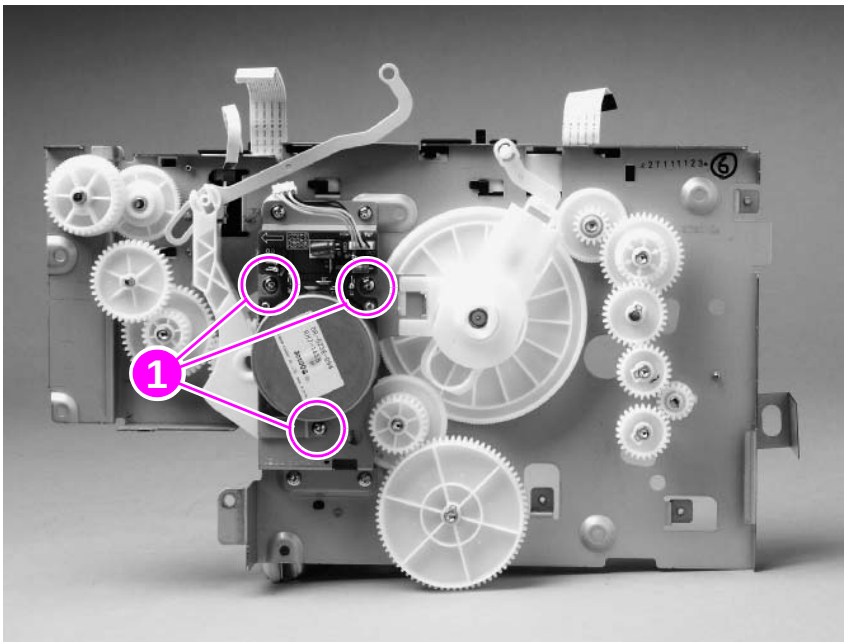

Figure 109. **Remove main motor**

Remove motor plate

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 132.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Remove the four screws (callout 1).

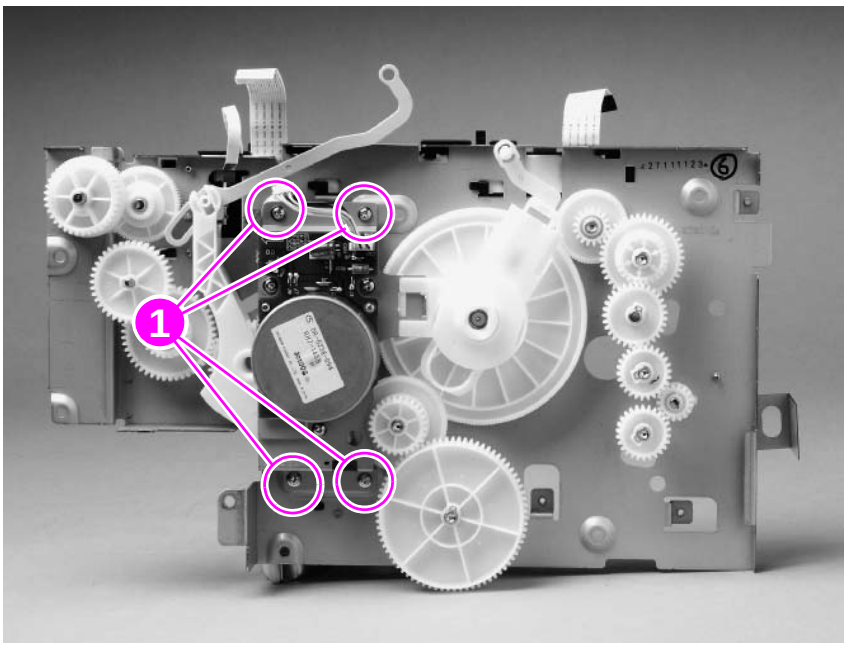

Figure 110. **Remove motor plate**

Step 3 Press and hold the retaining clip (callout 1), and then slide the motor plate out of the plastic holder while holding the bushing down with the other hand.

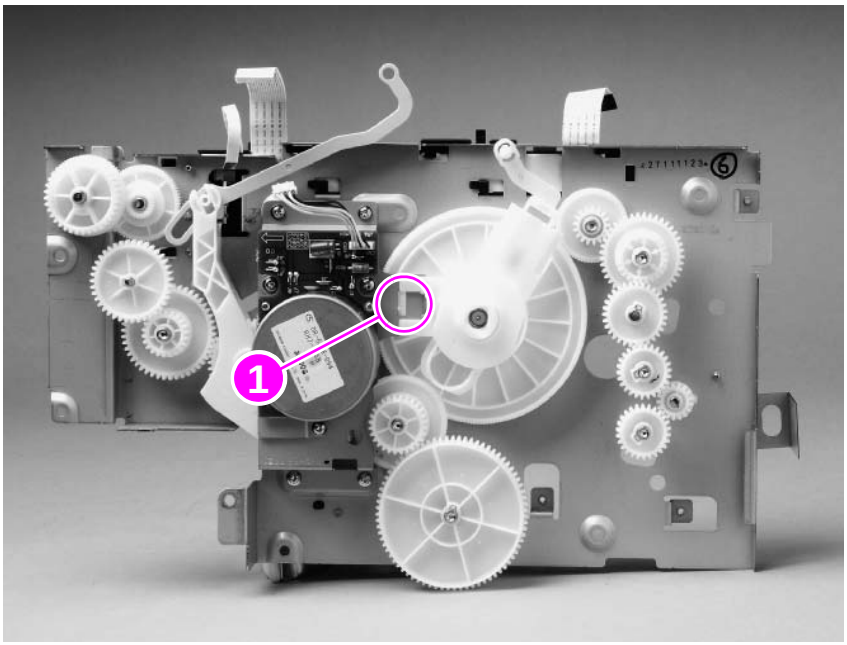

Figure 111. **Motor plate retaining clip**

Remove printer drive assembly gears

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the EIO card (if installed). See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Unplug the two ribbon cables. See “Remove ribbon cable harness” on page 132.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.
- Remove the motor plate. See “Remove motor plate” on page 137.

Note The drive assembly gears are secured to the drive assembly plate by either the motor plate or a keyed master gear positioned at the top of a gear cluster.

Step 2 Lift off the printer drive assembly gears. Remove the keyed master gear to free gears in a gear cluster (some gear clusters contain more than one keyed master gear).

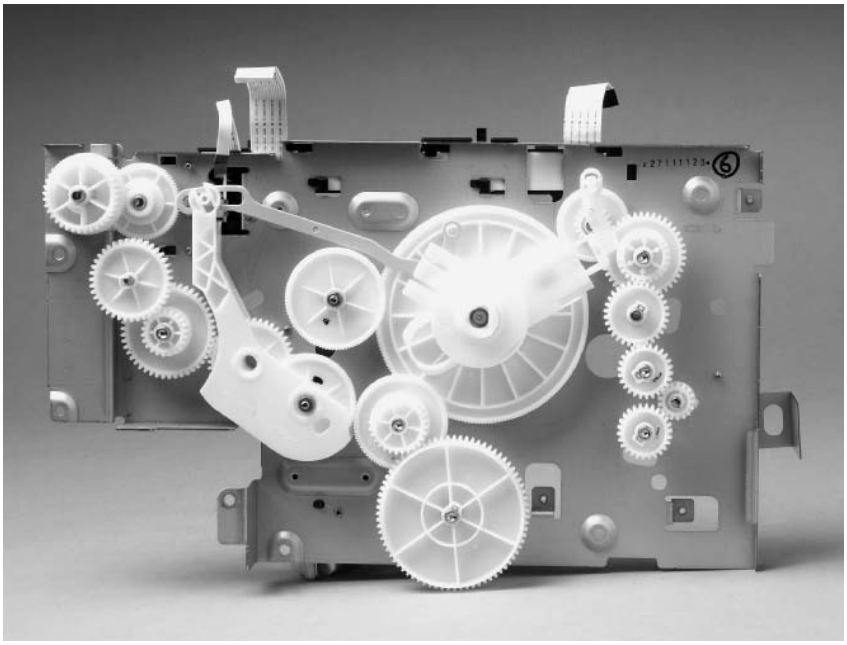

Figure 112. Remove printer drive-assembly gears

Remove tray 1 pickup roller

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove tray 1. See “Remove tray 1” on page 106.

Step 2 Rotate the left idler roller (callout 1) (on the cooling fan side) until its release tab is exposed.

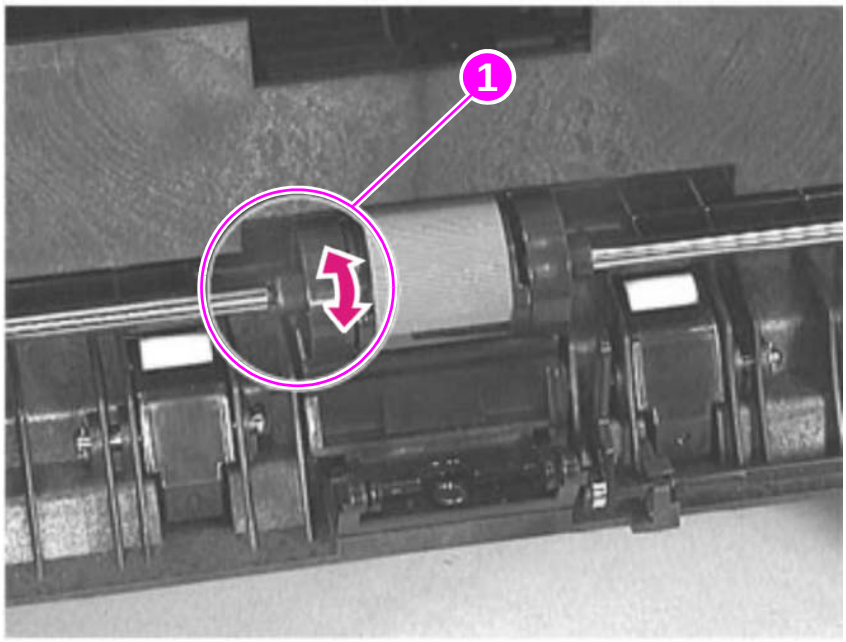

Figure 113. **Locate left idler roller release tab**

Step 3 Press and hold down the separation pad.

Step 4 Grasp the roller, as shown below. Press and hold the release tab.

Step 5 Slide the idler roller to the left (toward the fan side).

Step 6 Repeat steps 2 through 5 for the right roller with all actions oriented toward the printer drive-assembly side.

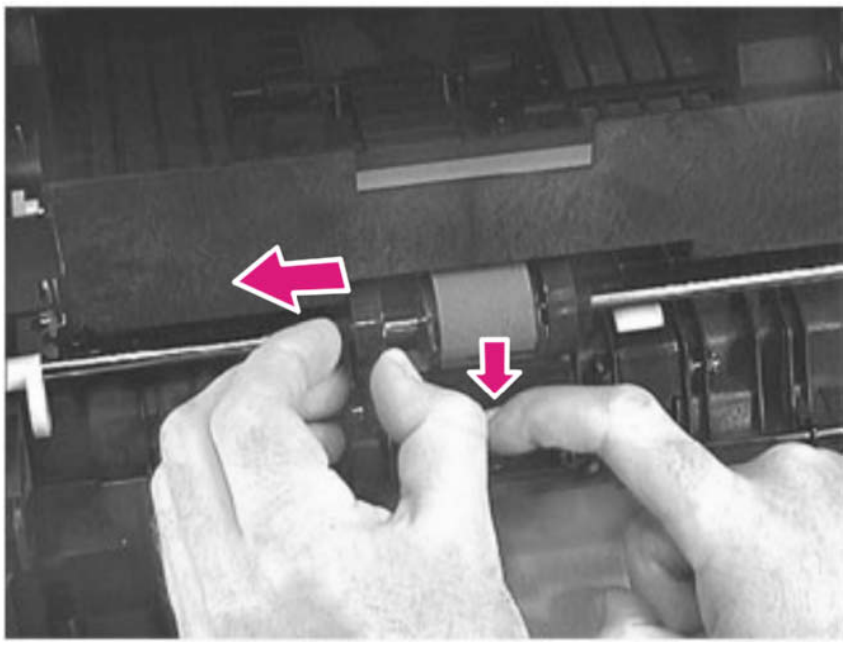

Figure 114. Release roller

Step 7 Press and hold the roller release tab that was exposed when the right roller was moved.

Step 8 Move the roller slightly to the right (toward the printer drive assembly), and rotate it forward and out.

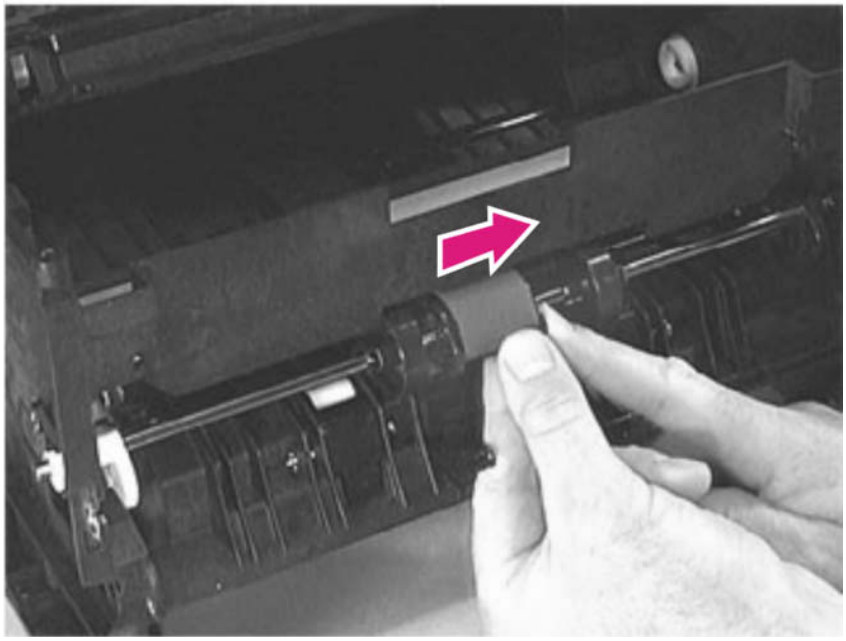

Figure 115. Release tray 1 separation roller

Remove tray 1 pickup roller assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove tray 1. See “Remove tray 1” on page 106.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Rotate the pickup-roller gear (callout 1) to clear the solenoid arm, and press the gear’s locking tab.

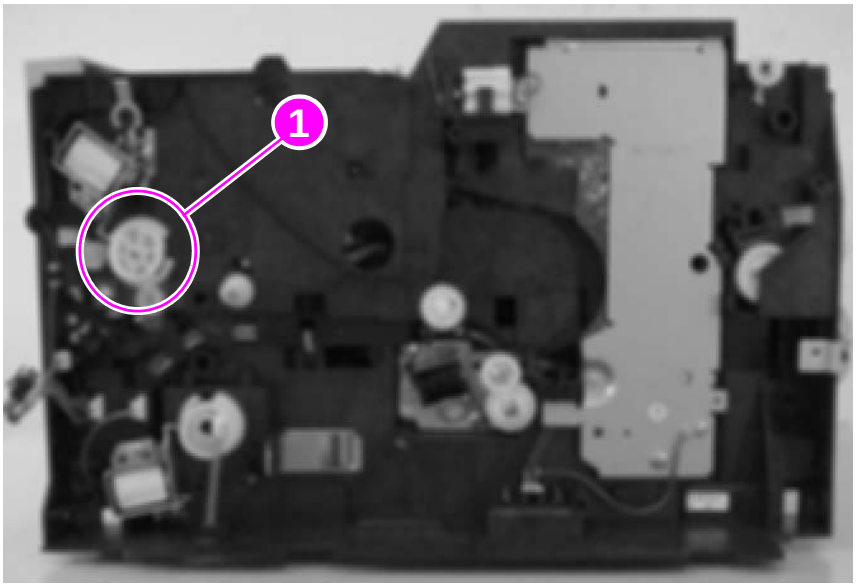

Figure 116. **Remove tray 1 pickup-roller gear**

Step 3 Unsnap the locking lever on the black bushing (callout 1). Rotate the bushing until its locking tab aligns with the slot in the chassis. Remove the bushing.

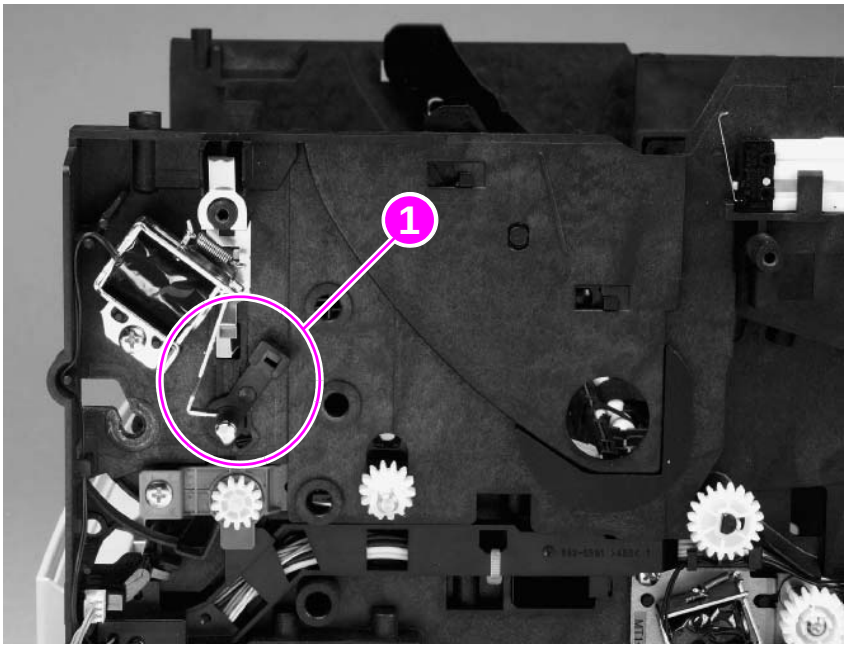

Figure 117. Remove black bushing

Step 4 Unsnap the locking lever on the white bushing (callout 1) (located on the opposite side of the printer chassis). Rotate the bushing until its locking tab aligns with the slot in the chassis. Remove the bushing.

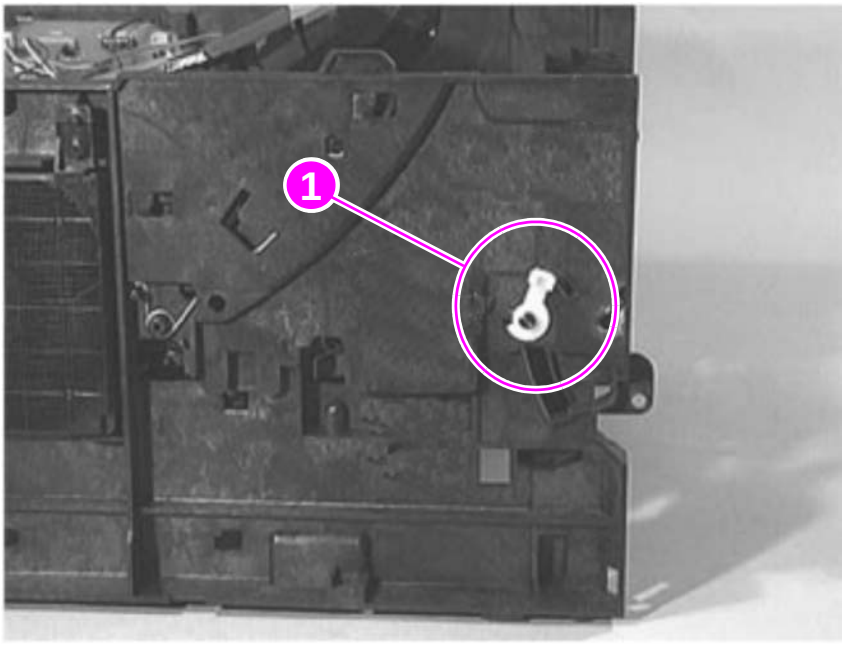

Figure 118. Remove white bushing

Step 5 Slide the tray 1 pickup roller assembly towards the roller solenoid side of the printer until the it clears the opening.

Step 6 Rotate the tray 1 pickup roller assembly away from the printer. Lift it off.

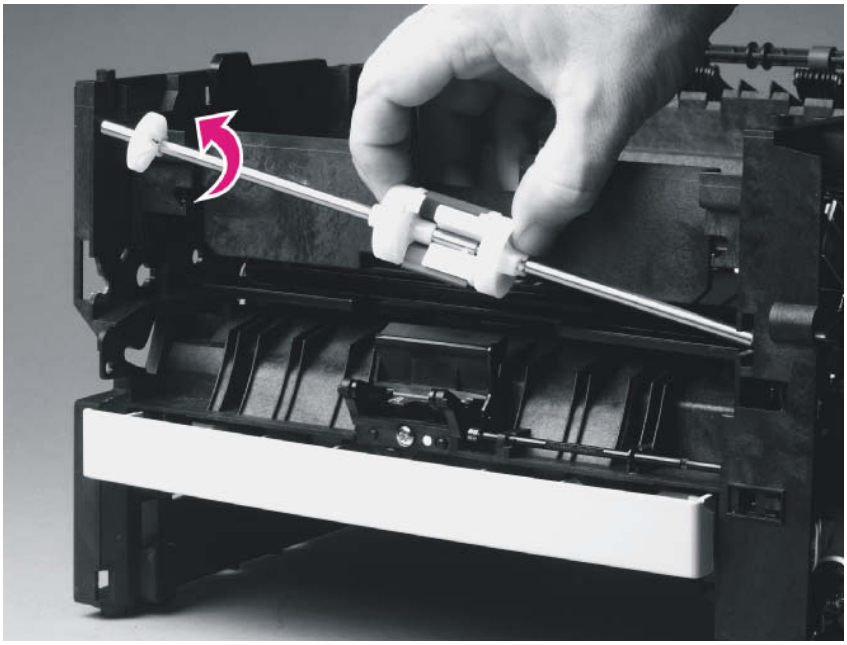

Figure 119. **Remove tray 1 pickup roller assembly**

Remove tray 1 separation pad assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove tray 1. See “Remove tray 1” on page 106.
- Remove the tray 1 pickup roller assembly. See “Remove tray 1 pickup roller” on page 140.

Step 2 Rotate the separation pad fully forward.

Step 3 Gently squeeze the mounting feet of the assembly to release it from the pivot pins.

Step 4 Lift off the tray 1 separation-pad assembly.

Step 5 If required, remove the single separation-pad mounting bracket mounting screw and remove the mounting bracket.

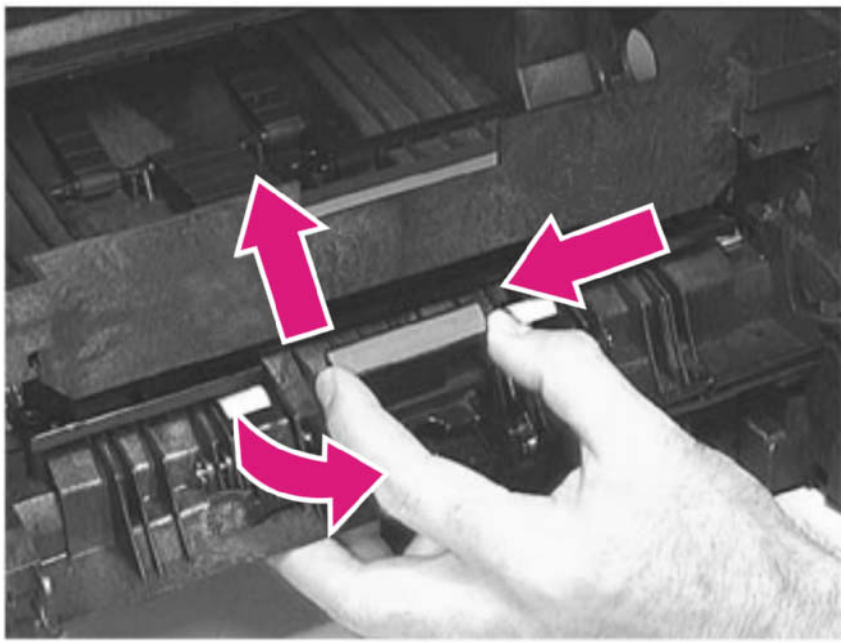

Figure 120. Remove tray 1 separation-pad assembly

Remove tray 1 paper-sensor lever

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove the left cover. See “Remove left cover” on page 105.
- Remove tray 1. See “Remove tray 1” on page 106.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Unplug the paper-sensor lever optic harness (callout 1).

Step 3 Grasp the paper sensor by the harness connector and squeeze the two locking tabs.

Step 4 Rotate the paper-sensor harness-connector away from the chassis.

Step 5 Lift off the paper sensor.

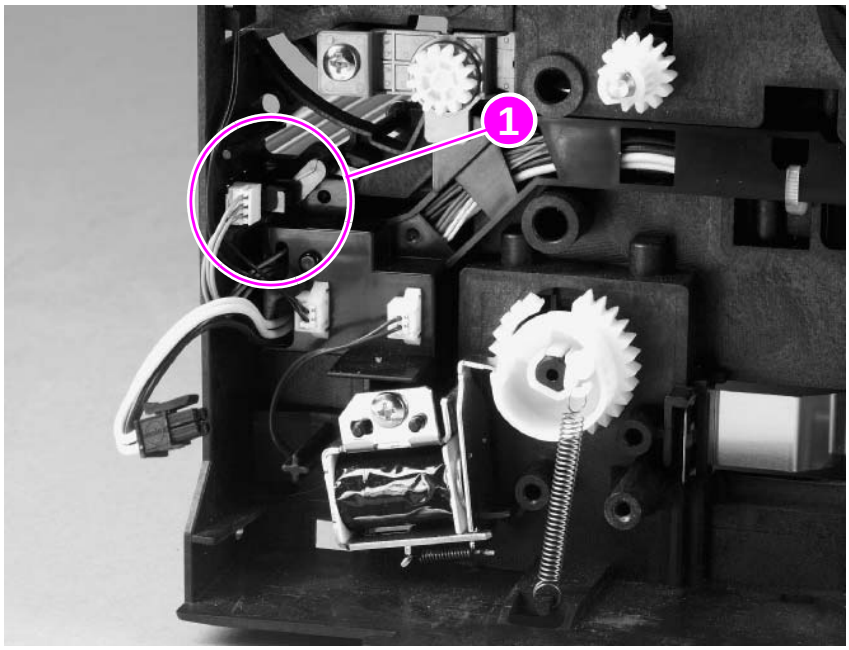

Figure 121. Remove paper sensor

Step 6 Pull the center of the paper-sensor lever outward, and then slide it toward the printer drive side of the printer until it stops.

Step 7 Rotate the paper-sensor lever to the horizontal position and lift it out.

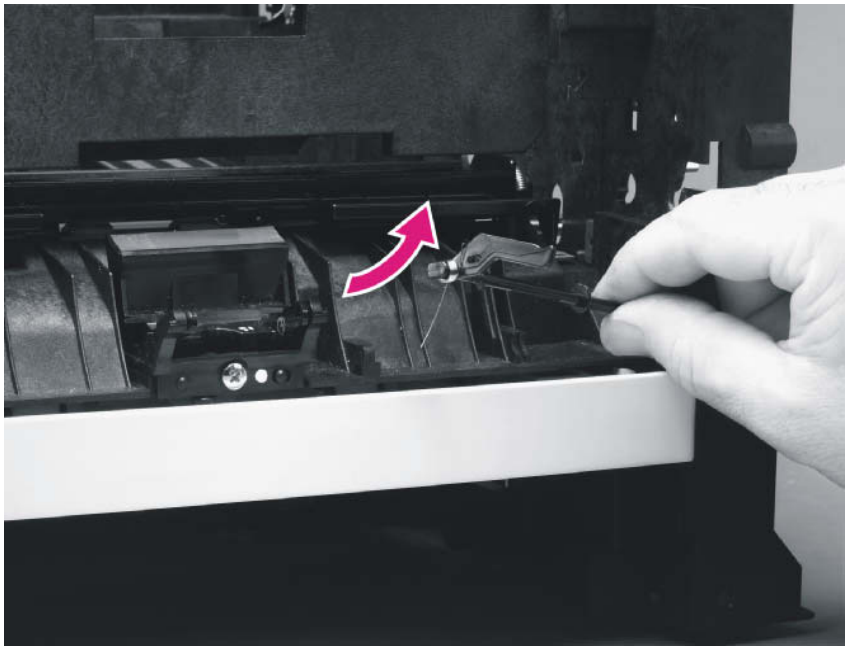

Figure 122. **Remove the tray 1 paper-sensor lever**

Note When replacing the paper-sensor lever, verify that the tail of the lever spring is correctly positioned to produce a positive forward force on the lever and ensure correct paper-sensor lever operation. Verify that the sensor lever moves freely after the paper-sensor lever or sensor optic has been replaced.

Remove tray 1 solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Trace the two-pin solenoid wire harness (callout 1) and unplug it from the connector.

Step 3 Unlace the wire harness from the loops.

Step 4 Remove the mount screw (callout 2).

Step 5 Lift off the tray 1 solenoid.

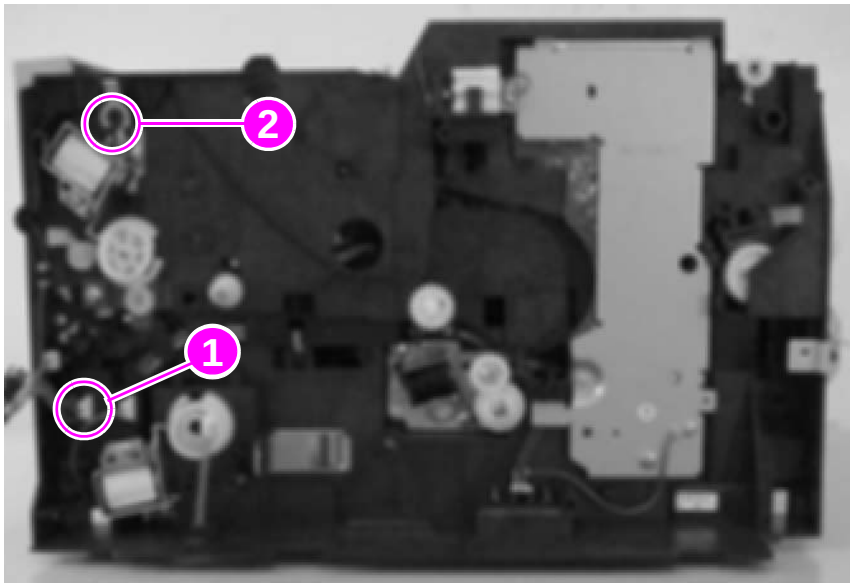

Figure 123. Remove tray 1 solenoid

Remove tray 2 pickup roller assembly

Note Do not touch the surface of the pickup roller with bare hands. Skin oils can damage the roller.

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.

Step 2 Place the printer top down with the infrared sensor port facing forward.

Figure 124. **Top down with infrared sensor port facing forward**

Step 3 Unsnap and rotate the locking lever of the white bushing (callout 1).

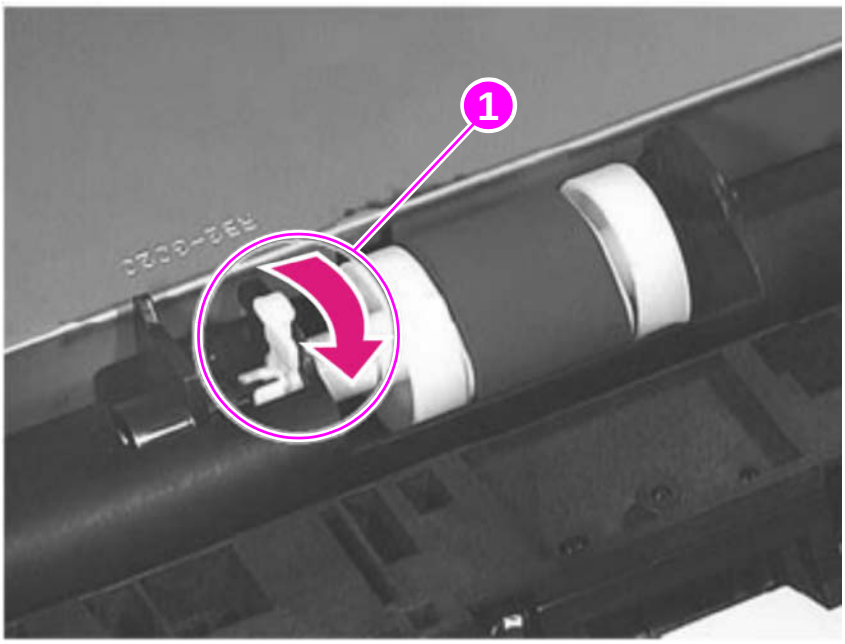

Figure 125. **Unlock and rotate the white bushing**

Step 4 Align the locking tab bushing with the opening in the roller carriage.

Step 5 Slide the bushing away from the roller assembly.

Note To make the bushing slide more easily, rotate the bushing lever toward the rear of the printer (after the locking tab clears the carriage opening).

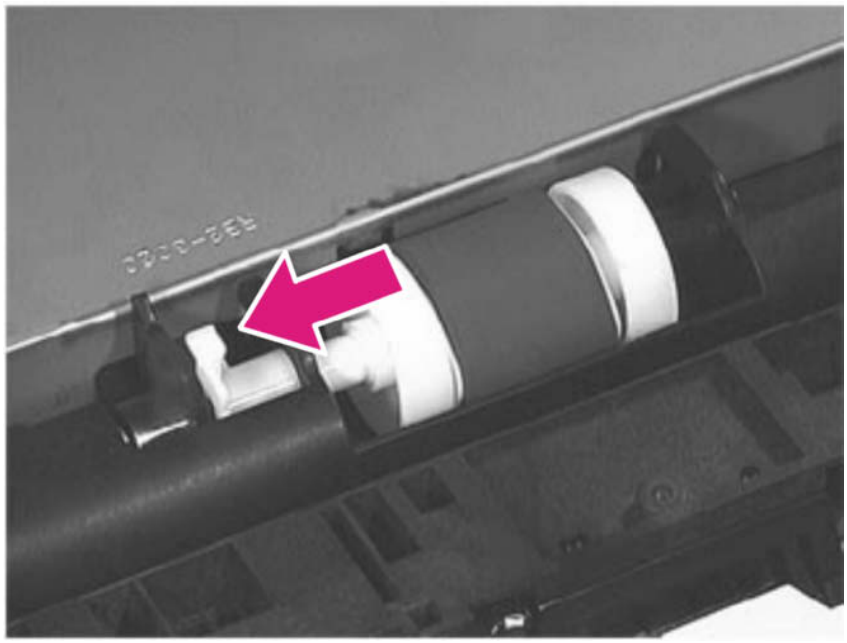

Figure 126. Slide the bushing away from roller assembly

Step 6 Unsnap the locking lever of the black bushing (callout 1) and rotate to align the bushing's locking tab with the opening in the roller carriage.

Step 7 Slide the bushing away from the roller assembly and remove the it from the roller assembly shaft.

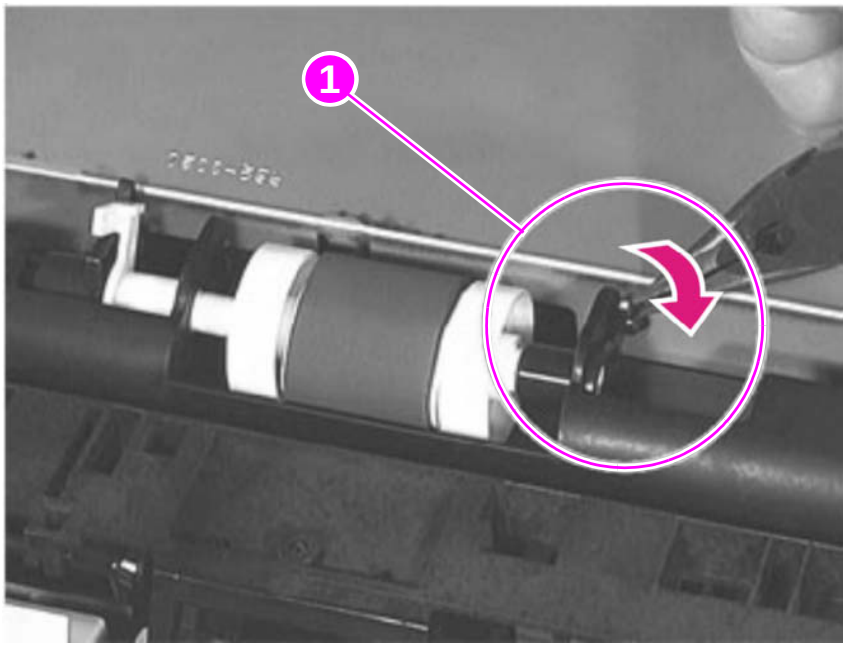

Figure 127. Remove black bushing

Step 8 Slide the roller assembly away from the white bushing (allow the shaft extend into the mounting hole of the black bushing).

Step 9 Tilt the roller assembly shaft out of the carriage, and lift it out.

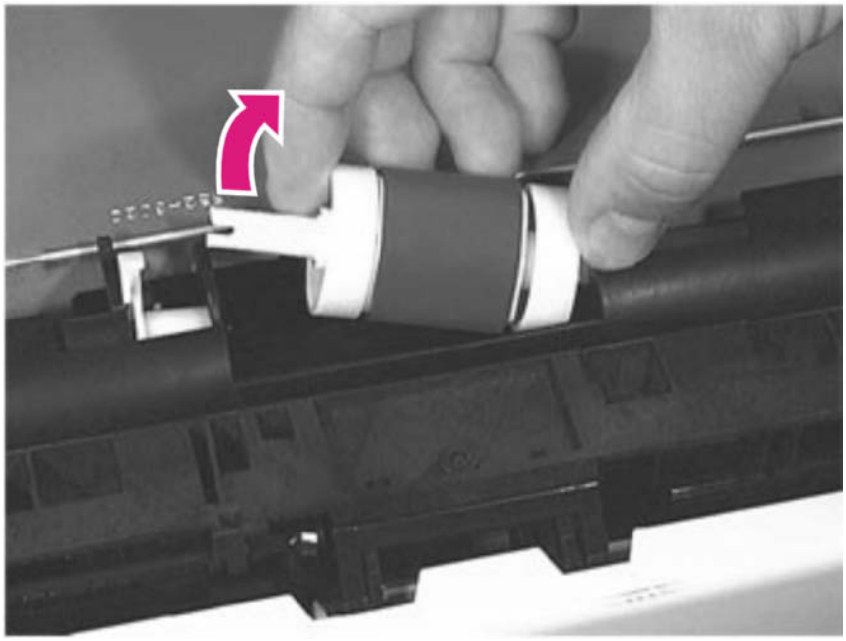

Figure 128. **Remove the pickup roller assembly**

Note When replacing the pickup roller assembly, verify that the paper-to-tray sensor arm moves freely and is correctly positioned. Verify that the pickup roller assembly completely engages the drive shaft.

Replace tray 2 pickup roller

Step 1 Remove the two rollers from the pickup roller.

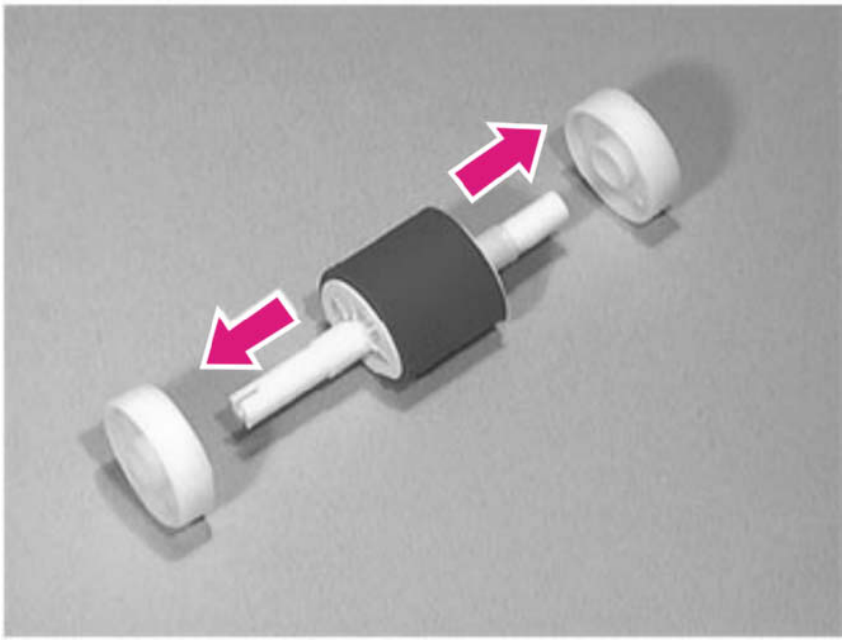

Figure 129. **Remove rollers**

Step 2 Place the two rollers on the ends of the replacement pickup roller.

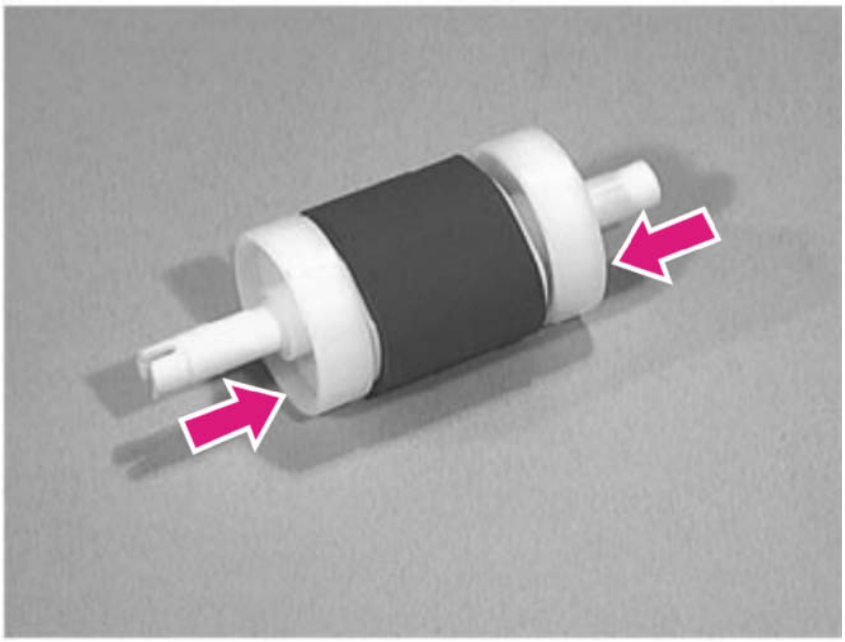

Figure 130. **Replace rollers**

Remove tray 2 pickup roller and refeeder assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the EIO card. See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove duplexer tray. See “Remove duplexer tray” on page 120.
- Remove the power supply. See See “Remove power supply assembly” on page 122.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Note The following removal is only required if the refeeder sensor lever is being removed.

- Remove the registration assemble. See “Remove registration assembly” on page 158.

Step 2 Rotate the gear (callout 1) to clear the solenoid arm then remove the gear and spring.

Note To remove the tray 2 pickup-roller drive shaft, release the locking tab of the white bushing at the solenoid end and slide the shaft out of the roller carriage.

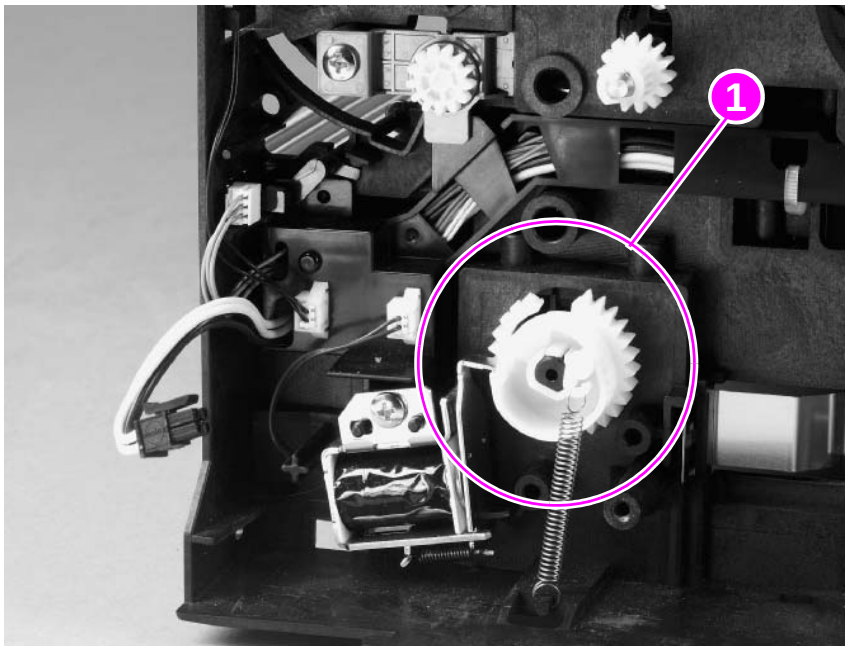

Figure 131. Remove tray 2 pickup-roller gear and spring

Note When replacing the shaft, verify the tray 2 paper-sensor lever moves freely.

Step 3 Place the printer top-down with the infrared port facing forward.

Step 4 Remove the two mounting screws from the duplex cover, disengage the duplexer release lever from the refeeder assembly, and remove the lever.

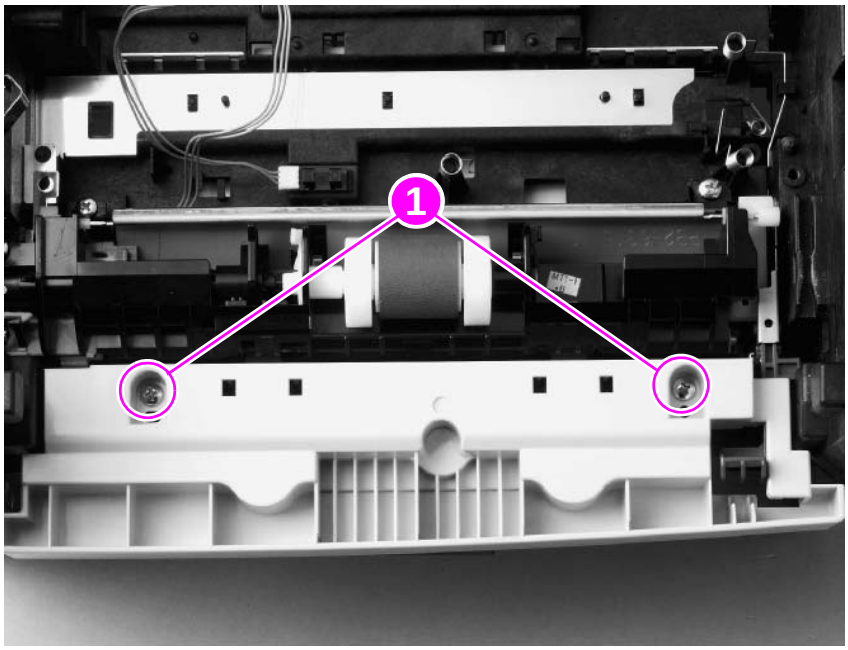

Figure 132. Remove the duplex cover

Step 5 Unplug the refeeder three-pin harness.

Step 6 Remove the five mounting screws (callout 1) from the tray 2 pickup roller and refeeder assembly.

Step 7 Lift off the tray 2 pickup roller and refeeder assembly.

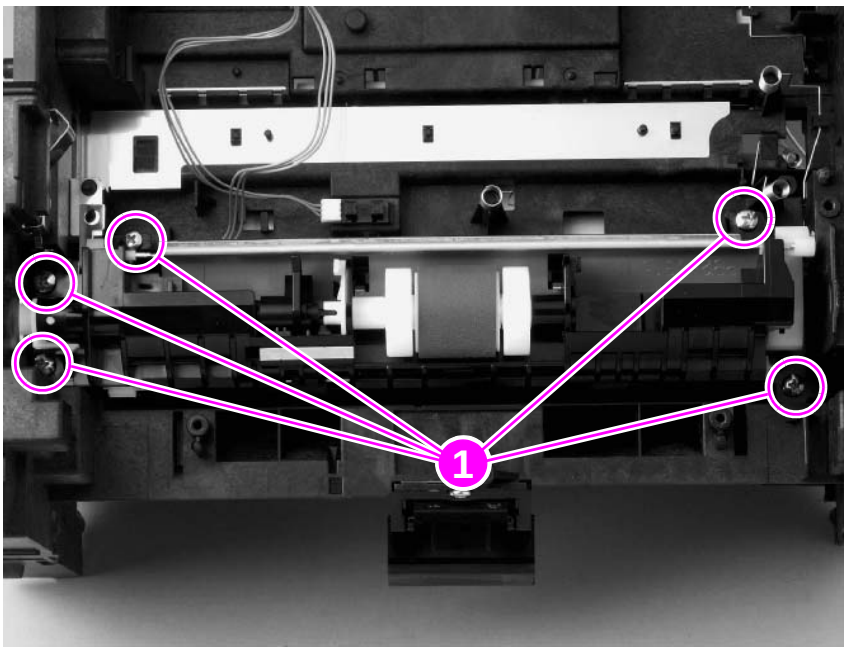

Figure 133. Remove tray 2 pickup-roller and refeeder assembly

Step 8 Unplug the optic sensor three-pin harness from the optic sensor.

Step 9 Grasp the optic sensor (callout 1) by the harness connector and squeeze the two locking tabs. Rotate the sensors harness connector away from the chassis.

Step 10 Lift out the sensor.

Step 11 Squeeze the locking tabs of the sensor lever arm and push down on the lever (towards the laser/scanner side).

Step 12 Lift out the paper-sensor lever.

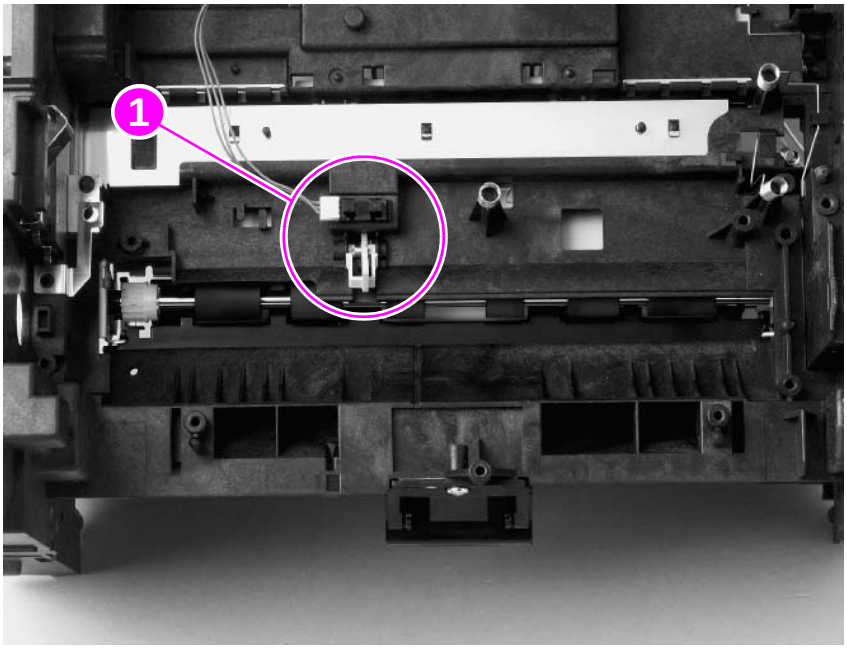

Figure 134. **Remove tray 2 optic sensor and lever**

Note

When replacing the paper-sensor lever, verify that the tail of the lever spring is correctly positioned to produce a positive forward force on the lever and ensure correct paper-sensor lever operation. Verify that the sensor lever moves freely after the paper-sensor lever or sensor optic has been replaced.

Remove tray 2 solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the EIO card. See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Trace the two-pin solenoid wire harness and unplug it from the connector.

Step 3 Remove the screw, as shown.

Step 4 Lift out the tray 2 solenoid.

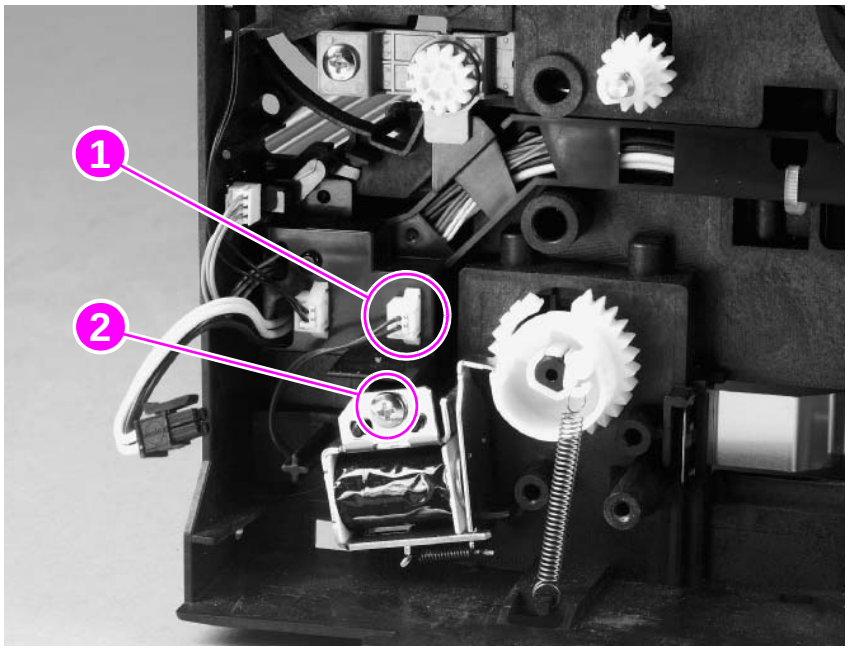

Figure 135. **Remove the tray 2 solenoid**

Remove duplexer drive gears and solenoid

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the EIO card. See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Gently pry apart the two locking tabs on the topmost duplexer drive gear (callout 1) and remove the gear. Repeat for the remaining drive gear.

Step 3 Unlace the 2-pin solenoid wire harness from the loops and disconnect the connector (callout 2) (if an earlier printer driver assembly removal was performed, the connector was previously unplugged).

Step 4 Remove the mount screw (callout 3).

Step 5 Lift out the duplexer solenoid.

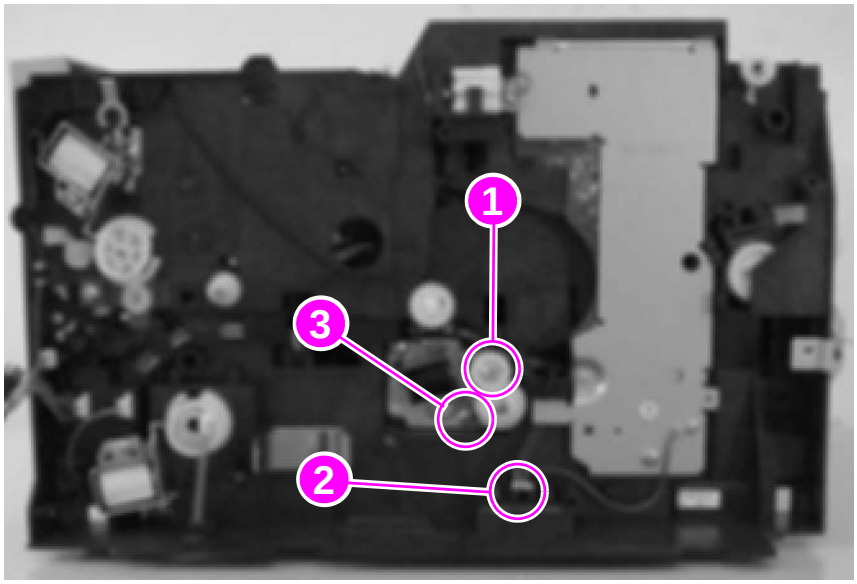

Figure 136. Remove duplexer drive gears and solenoid

Remove registration assembly

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the EIO card. See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Remove the registration-assembly drive gear (callout 1).

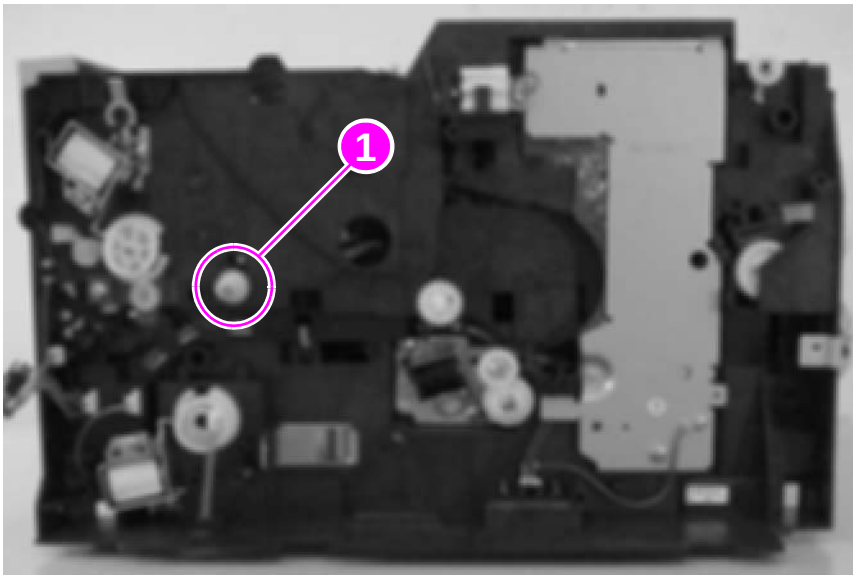

Figure 137. **Remove registration-assembly drive gear**

Step 3 Remove the six mounting screws (callout 1).

Step 4 Lift the assembly to the left (the cooling-fan side), and then to the right (the printer-drive assembly side) to free it.

Step 5 Lift out the registration assembly.

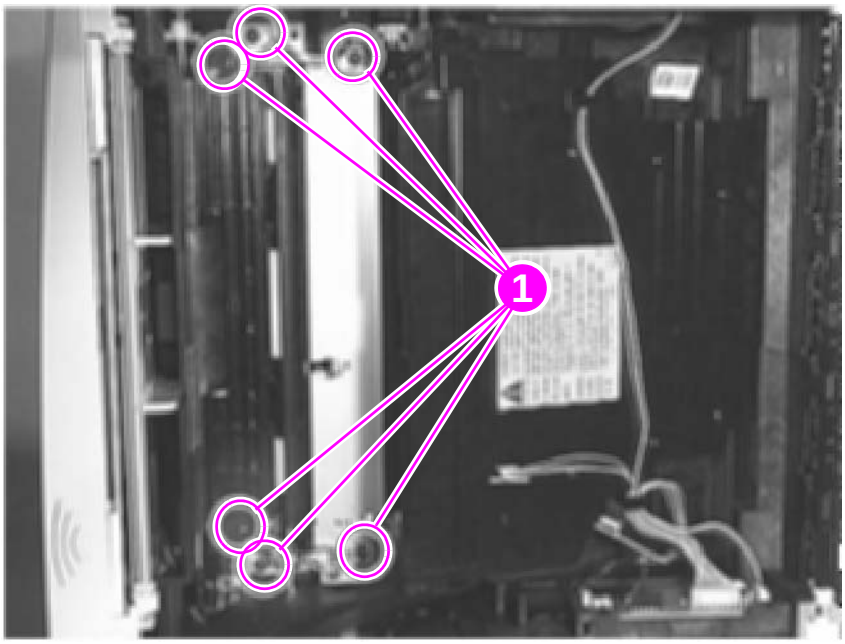

Figure 138. **Registration assembly**

Remove tray 3 assembly connector

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the EIO card. See “Remove EIO card” on page 98.
- Remove the formatter PCB. See “Remove formatter PCB” on page 112.
- Remove the printer drive assembly. See “Remove printer drive assembly” on page 134.

Step 2 Unplug the four-pin and three-pin tray 3 harness connectors (callout 1).

Step 3 Squeeze the wing nuts with needle-nose pliers, and push the connector through the opening.

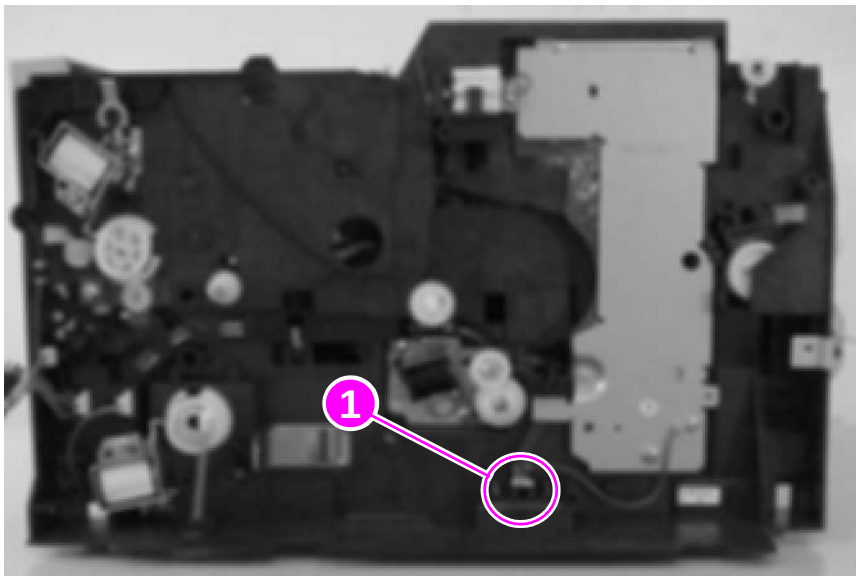

Figure 139. **Remove the tray 3 connector**

Remove cooling fan

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.

Step 2 Trace the 3-pin fan wire harness and unplug its connector (callout 1).

Step 3 Unlace the harness from the loops (callout 2) on the scanner assembly.

Step 4 Remove the two fan mounting screws (callout 3) and lift out the fan.

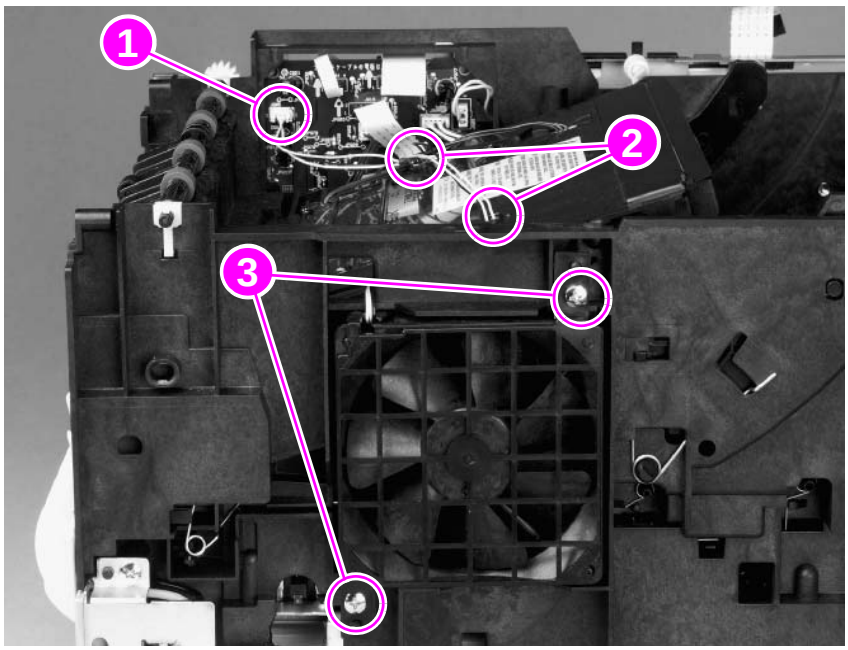

Figure 140. **Remove cooling fan**

CAUTION When replacing the fan, verify that the air flow is directed into the printer cabinet (the fan is marked with a air flow directional arrow located at the top of the fan housing).

Remove toner-cartridge guide

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.

Step 2 Press and hold in the toner-cartridge guide pin (callout 1).

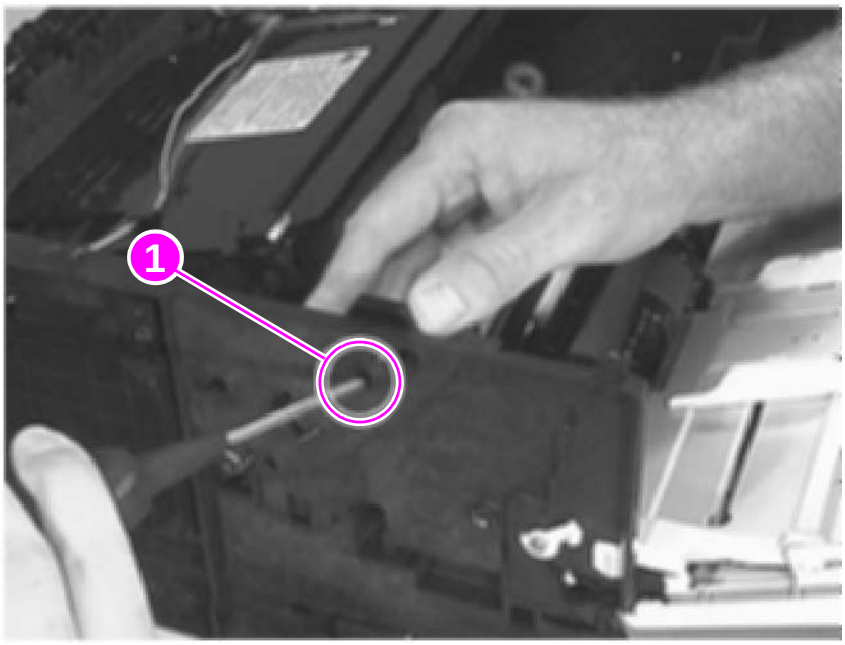

Figure 141. **Release toner-cartridge guide pin**

Step 3 Slide the guide forward (away from the laser/scanner assembly) and lift it out.

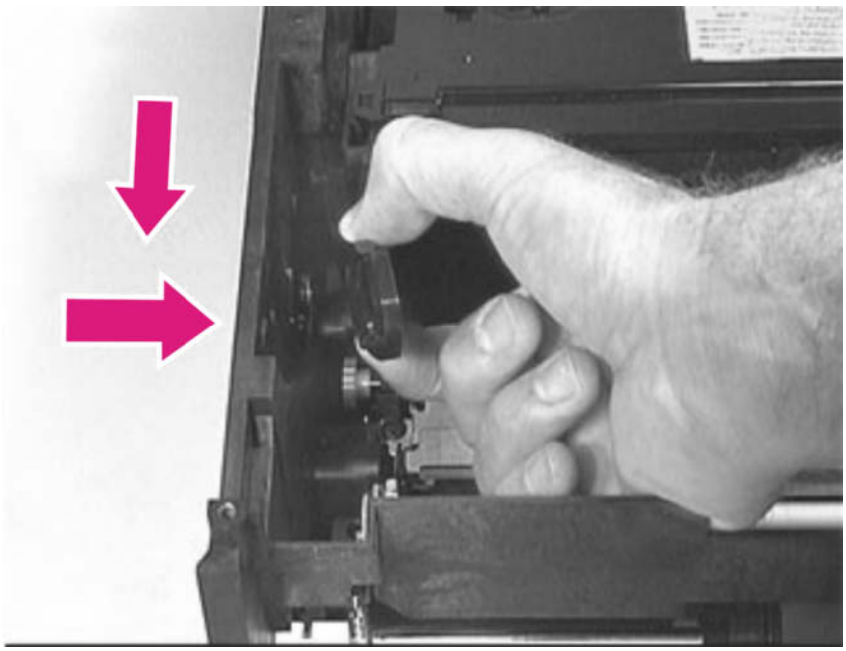

Figure 142. **Remove toner-cartridge guide**

Remove dc bias voltage contacts (leaf springs)

Step 1 Remove the following assemblies:

- Remove the toner cartridge. See “Toner cartridge removal and replacement” on page 96.
- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette from tray 2. See “Remove the cassette from tray 2” on page 97.
- Remove the DIMM cover. See “Remove DIMM cover” on page 99.
- Remove the rear cover. See “Remove rear cover” on page 100.
- Remove the top cover. See “Remove top cover” on page 102.
- Remove left cover. See “Remove left cover” on page 105.
- Remove the duplexer tray and media handling assembly. See See “Remove duplexer tray” on page 120.
- Remove the power supply assembly. See “Remove power supply assembly” on page 122.

Step 2 Identify the dc bias contact components.

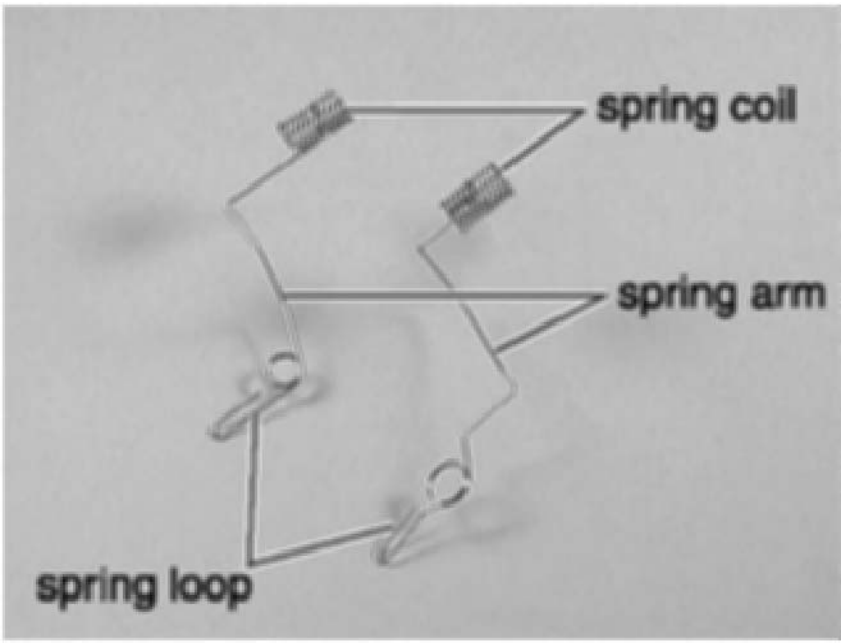

Figure 143. **Identify dc bias contacts**

Step 3 Release the spring coil (callout 1) from the retaining clip located on the bottom of printer.

Step 4 Remove the spring arm from the adjacent retaining clip.

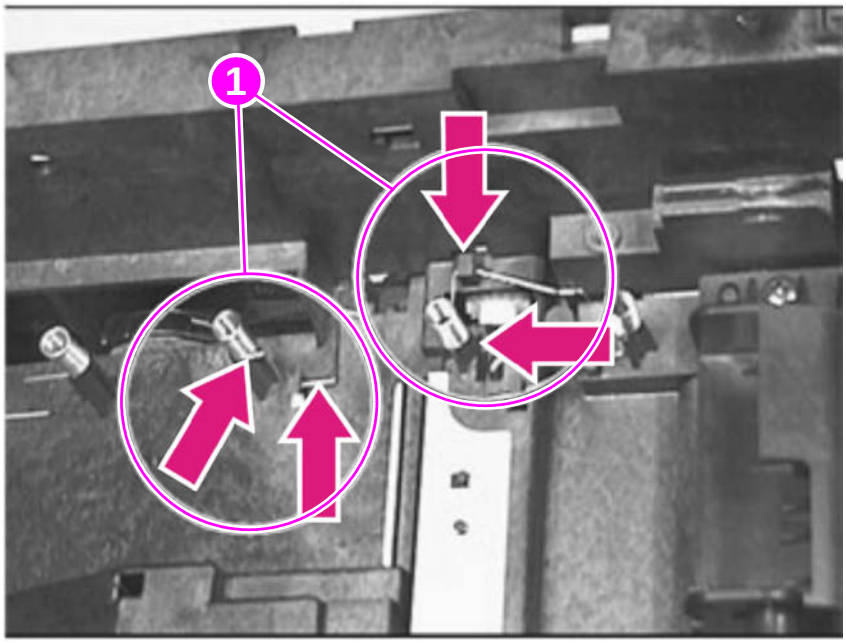

Figure 144. Release dc bias spring coil and spring arm

Step 5 Remove the spring arm (callout 1) from the post on the fan side of printer. This releases spring tension.

Step 6 Squeeze the spring loop and slide it out of its slot.

Step 7 Remove the spring from the side pivot pin.

Step 8 Lift out the dc bias voltage contact. Repeat for the remaining contact.

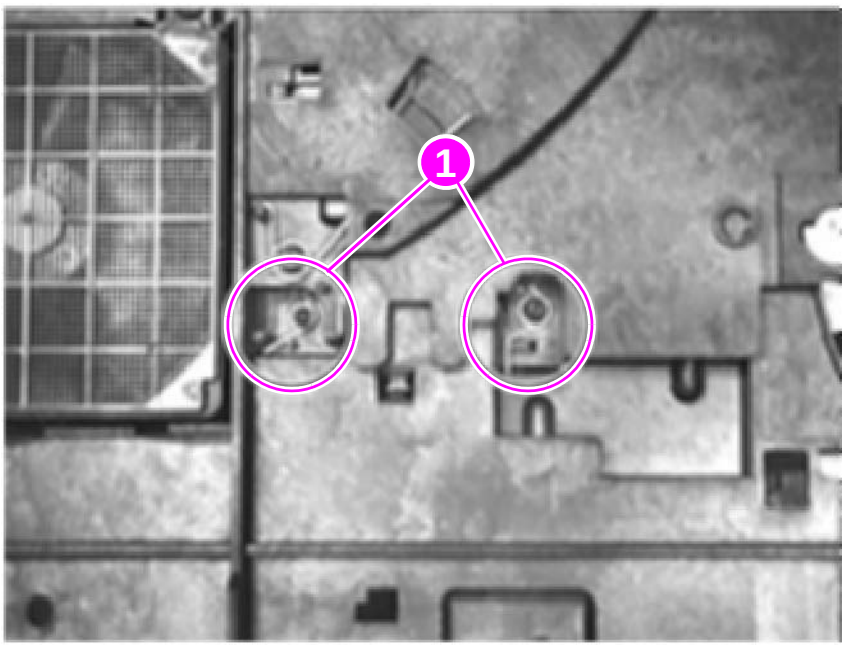

Figure 145. Spring loop

Tray 3 disassembly and assembly

Remove tray 3 (250-sheet feeder) cassette

Step 1 If installed, remove tray 3. See “Remove tray 3” on page 97.

Step 2 Firmly pull the cassette forward and out of the sheet-feeder.

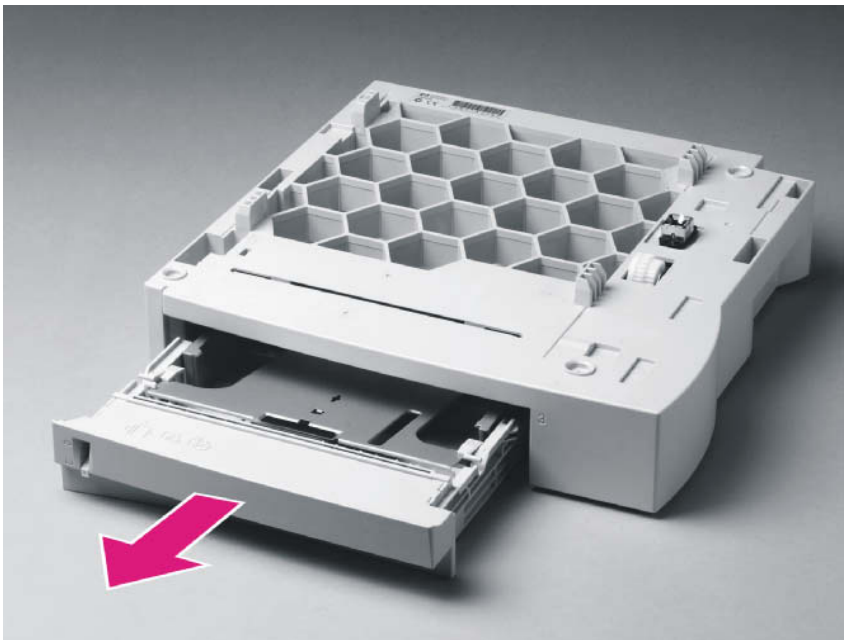

Figure 146. **Remove tray 3 (250-sheet feeder)**

Remove tray 3 (250-sheet feeder) pickup roller

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 166.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Place the blade of a small flatblade screwdriver in the slots (callout 1). Pop each cover off the cassette body.

Step 4 Follow steps 3 through 6 in “Remove tray 2 pickup roller assembly” on page 6-149 to complete removal.

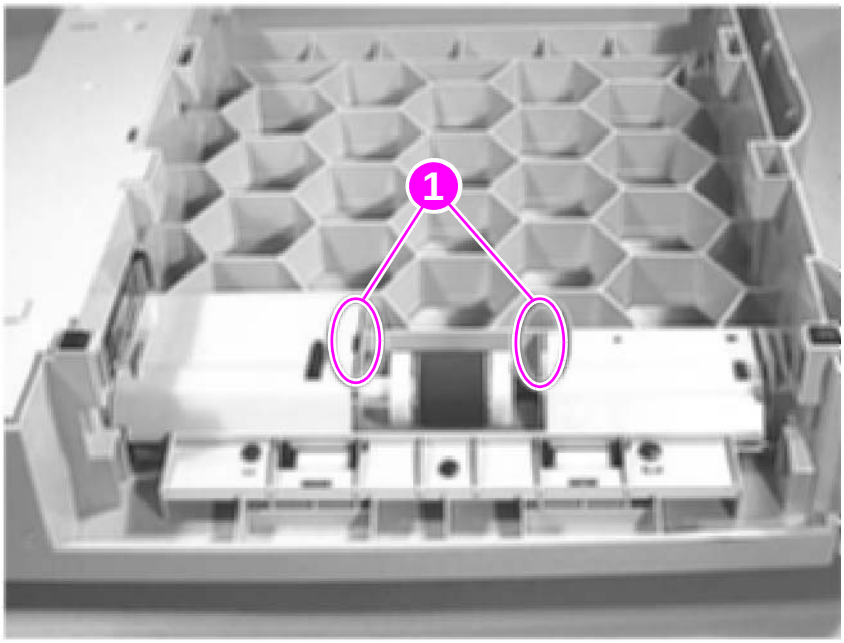

Figure 147. **Tray 3 (250-sheet feeder) roller**

Remove tray 3 (250-sheet feeder) feeder drive assembly

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 166.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Use a small flatblade screwdriver to disengage the cover’s locking tabs (callout 1).

Step 4 Lift the cover off the cassette.

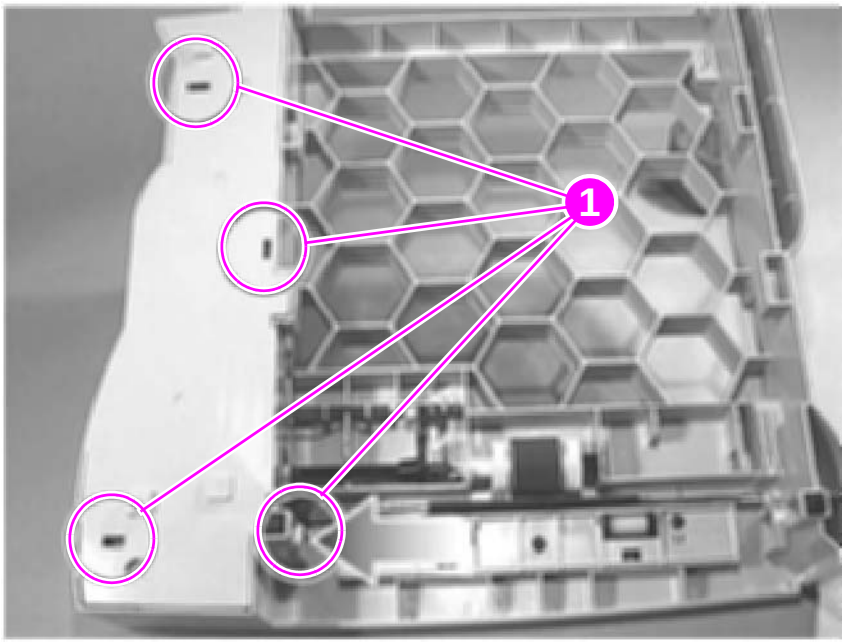

Figure 148. **Remove tray 3 (250 sheet-feeder) drive cover**

Step 5 Unplug the one-pin, two three-pin, and four-pin wire harnesses (callout 1) at the PCB.

Step 6 Unlace the harnesses from loops as required.

Step 7 Remove the four drive assembly mounting screws (callout 2).

Step 8 Depress the metal retaining latch (callout 3) (located on the tray side of the assembly).

Step 9 Lift out the drive assembly.

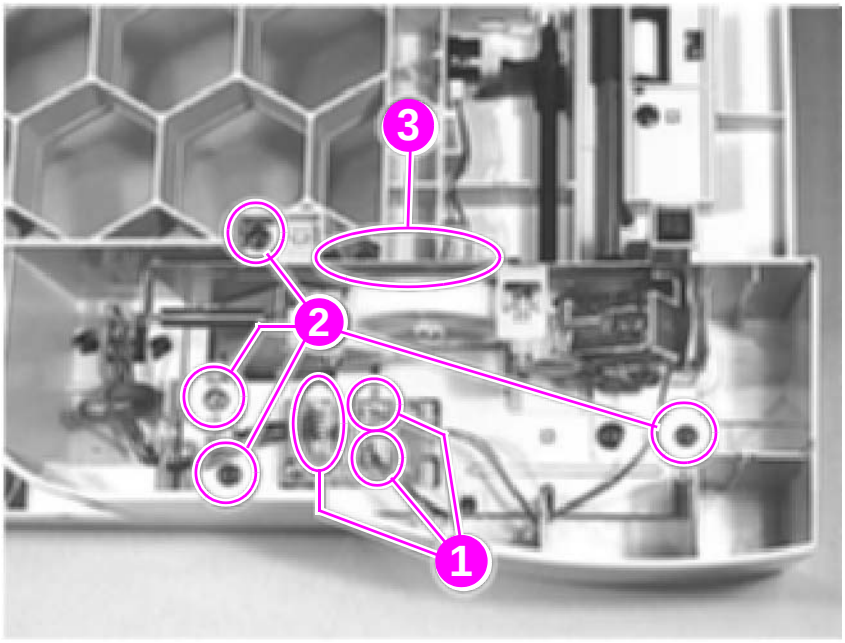

Figure 149. **Remove tray 3 (250 sheet-feeder) drive assembly**

Remove tray 3 (250 sheet-feeder) drive solenoid

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (250-sheet feeder) cassette” on page 166.
- Remove the tray 3 feeder drive assembly. See “Remove tray 3 (250-sheet feeder) feeder drive assembly” on page 168.

Step 2 Unplug the two-pin solenoid harness connector.

Step 3 Remove the single solenoid mounting screw.

Step 4 Lift out the solenoid.

Remove tray 3 (500-sheet feeder) cassette

Step 1 If installed, remove tray 3. See “Remove tray 3” on page 97.

Step 2 Firmly pull the cassette forward and out of the sheet-feeder.

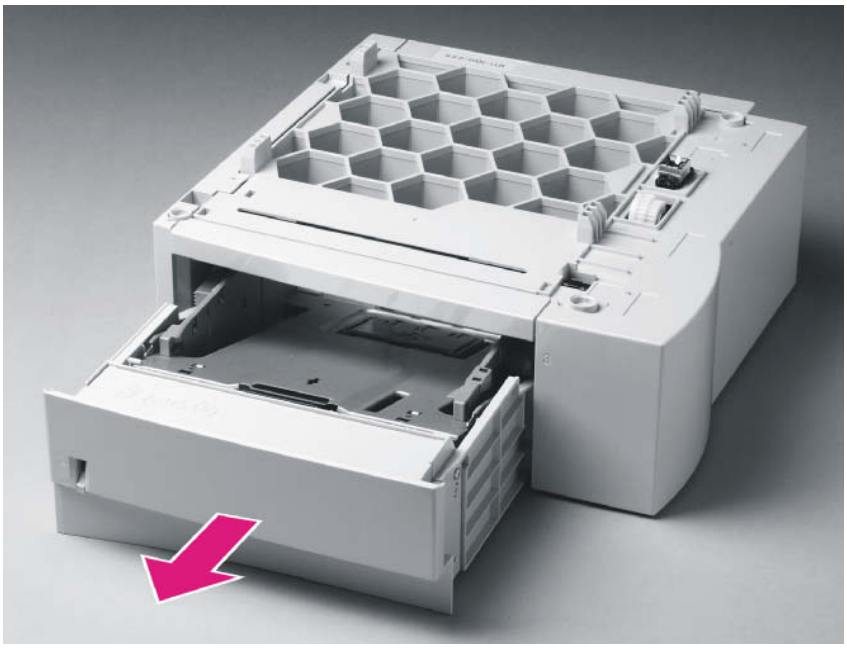

Figure 150. **Remove tray 3 (500-sheet feeder) cassette**

Remove tray 3 (500-sheet feeder) pickup roller

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 171.

Step 2 Place the sheet feeder top-down with the front facing outward.

Step 3 Place the blade of a small flatblade screwdriver in the slots (callout 1). Pop each cover off the cassette body.

Step 4 Remove the forward brace located directly over the pickup roller for easy access to the pickup roller assembly.

Step 5 Follow steps 3 through 6 in "Remove tray 2 pickup roller assembly" page 149 to complete removal.

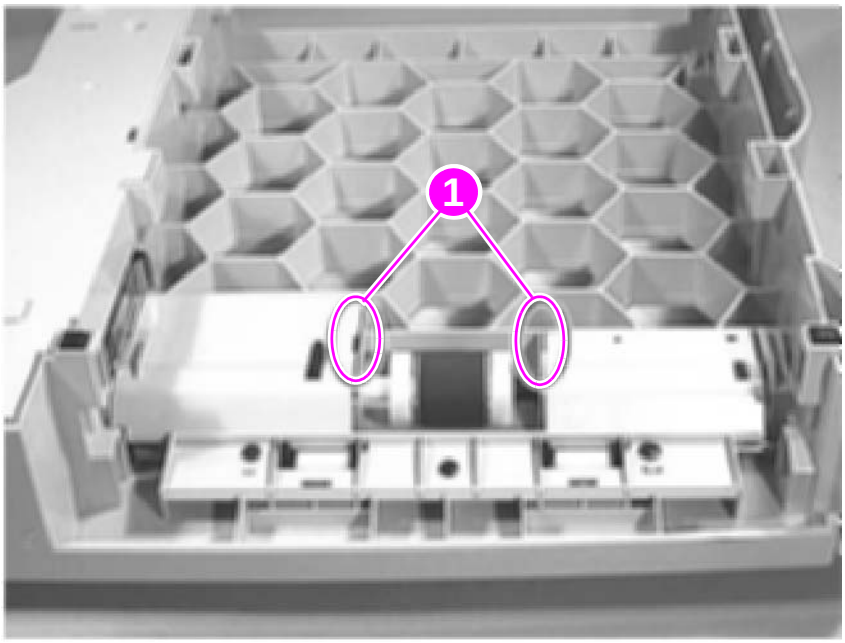

Figure 151. **Tray 3 (500-sheet feeder) pickup roller**

Remove tray 3 (500-sheet feeder) feeder drive assembly

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 171.

Step 2 Press down on the two locking pins (callout 1).

Step 3 Rotate the top of the cover away and down from the cassette.

Step 4 Lift the cover away from the cassette.

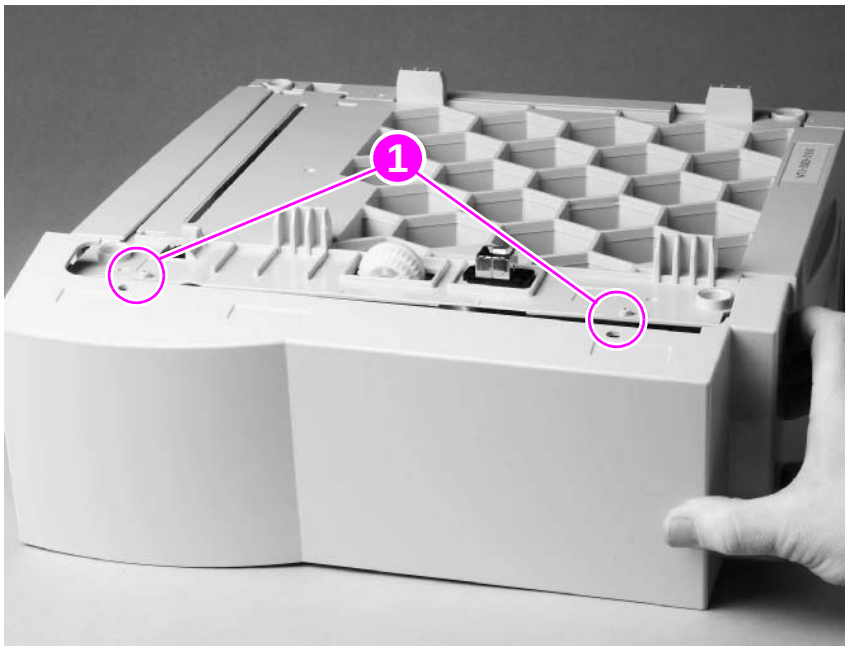

Figure 152. **Remove tray 3 (500 sheet-feeder) drive cover**

Step 5 Unplug the one-pin, three-pin, and four-pin cassette docking plug wire harnesses (callout 1) at the docking plug.

Step 6 Unplug three-pin optic sensor connector (callout 2) at the PCB.

Step 7 Unlace the harnesses from loops as required.

Step 8 Remove the three drive assembly mounting screws (callout 3).

Step 9 Depress the metal retaining latch (located on the tray side of the assembly).

Step 10 Lift out the drive assembly.

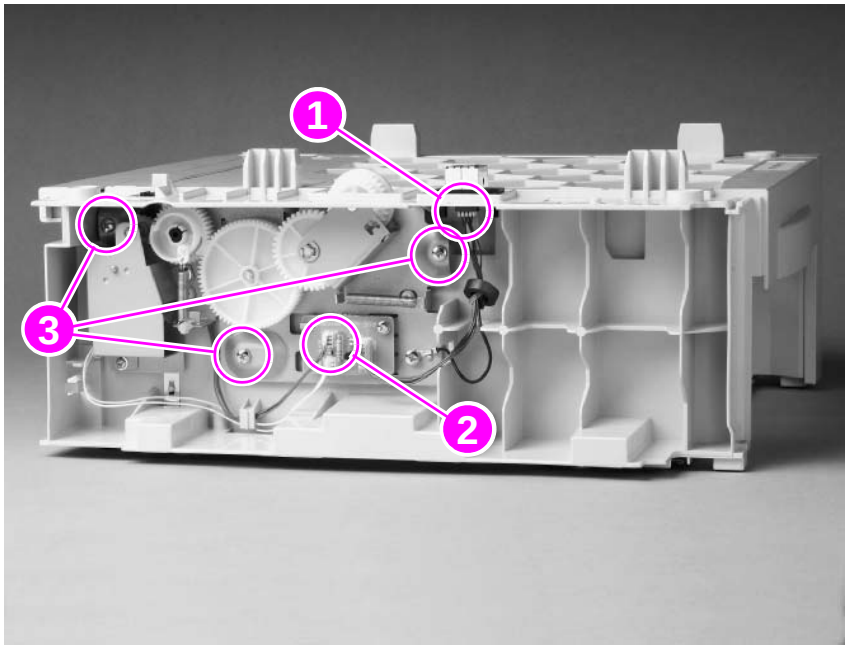

Figure 153. **Remove tray 3 (500 sheet-feeder) drive assembly**

Remove tray 3 (500 sheet-feeder) drive solenoid

Step 1 Remove the following assemblies:

- If installed, remove tray 3. See “Remove tray 3” on page 97.
- Remove the cassette. See “Remove tray 3 (500-sheet feeder) cassette” on page 171.
- Remove the tray 3 feeder drive assembly. See “Remove tray 3 (500-sheet feeder) feeder drive assembly” on page 173.

Step 2 Unplug the two-pin solenoid harness connector.

Step 3 Remove the two solenoid bracket-mounting screws.

Step 4 Turn the bracket over to expose the solenoid and remove the single solenoid mounting screw.

Step 5 Lift out the solenoid.

7 Troubleshooting

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Troubleshooting process

Preliminary operating checks

Make sure that the following conditions are met before troubleshooting a specific printer problem:

- The printer is plugged in and power is delivered to the outlet as specified on the power rating label.
- The selected tray contains media that has been properly loaded.
- The toner cartridge is installed properly.
- The printer is receiving maintenance on a regular basis.
- Any I/O devices are properly installed.
- The customer is using acceptable print media.
- The printer is positioned on a solid, level surface.
- The line voltage does not vary more than 10 percent from the nominal rated value specified on the power rating label.
- The operating environment for the printer is within the temperature and humidity specifications.
- The printer is never exposed to ammonia fumes such as those produced by diazo copiers or office cleaning materials.
- The printer is not exposed to direct sunlight.
- Non-HP components (such as refilled toner cartridges, font cartridges, and memory boards) are removed from the printer.

Note Sudden changes in the printer's environment can cause image defects and media-handling problems. Always make sure the printer is not exposed to direct sunlight or to heating or cooling vents. Allow time for the printer and media to acclimate whenever changing environments (for example, moving from a cold environment to a warm one). Acclimation can take anywhere from 3 to 24 hours depending on the ambient conditions.

Basic fault isolation

The troubleshooting process is a systematic approach that first addresses the major problems first and then other problems to discover the causes for printer malfunctions and errors. The "Troubleshooting process flow" page 180 illustrates the major steps for troubleshooting the printing system. Each heading depicts a major troubleshooting step. A “YES” answer to the questions allows troubleshooting to proceed to the next major step.

A “NO” answer indicates that additional testing and correction is needed. Proceed to the referenced location in the chapter and follow the directions there. After completing the additional testing and correcting the problem, proceed to the next major step.

Note It is important to always follow this process in sequence. Failure to do so can result in increased repair time, difficulty, and expense.

This list describes the basic questions for the customer to answer and the corresponding troubleshooting section to help quickly define the problem(s).

Table 26. Major steps for troubleshooting

“Power-on” on page 181	Does the printer perform the initialization and power-on sequence? This section contains the procedures for correcting power supply problems.
“Troubleshooting with control-panel messages” on page 182	Does the control-panel light message indicate an error condition? This section contains the procedures for clearing control panel messages.
“Media-handling problems” on page 192	Is it possible to print a test page? This section contains information about troubleshooting paper-path and print-media problems.
“Evaluate the test pages” on page 198	Is there information in the status log? This section contains the procedures for printing the information pages and evaluating and correcting the printer’s configuration.
“Image-formation troubleshooting” on page 199	Does the print quality meet the customer’s expectations? This section contains toner cartridge checks, information about EconoMode, image defect examples, and the repetitive-defect ruler.
“Media troubleshooting” on page 209	This section contains information about how to determine print-media problems and correct them.
“Communication troubleshooting” on page 217	Can the customer print from the host system successfully? This section describes how to determine whether the printer is communicating properly with the host system.

Troubleshooting process flow

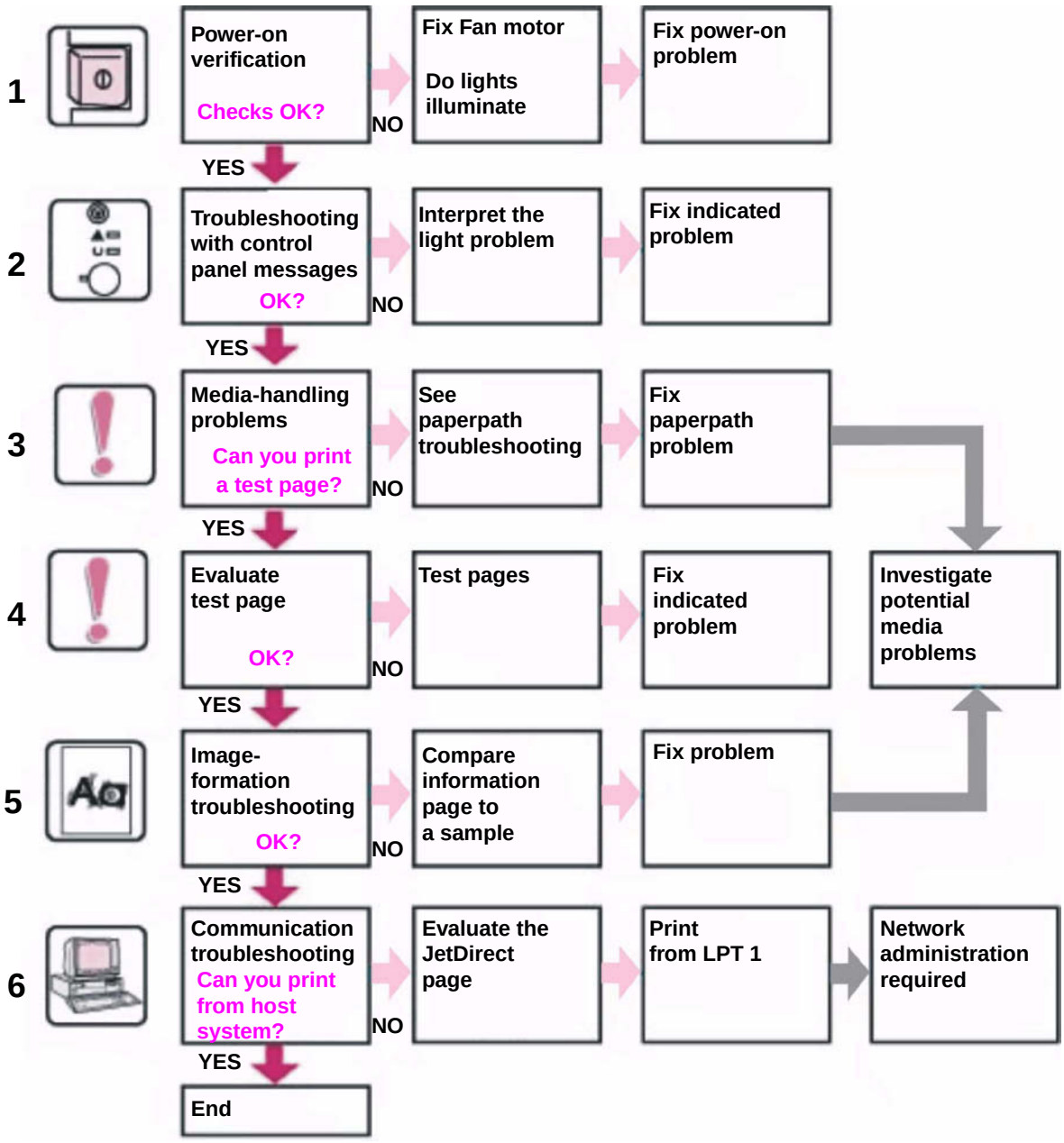


Figure 154. **Troubleshooting process flow**

Power-on

It is important to have the printer control panel lights functional as soon as possible in the troubleshooting process so that the printer's diagnostics can assist in locating printing errors.

Follow these steps to pinpoint power problems quickly.

Step 1 Confirm that the printer is plugged in to a reliable power source and the power switch is on.

Step 2 Verify that the fan and motors rotate.

Step 3 Verify that the formatter cables are connected properly.

Step 4 Verify that the control panel light pipes in the DIMM cover are not broken or damaged.

Step 5 Verify that the DIMM cover is installed properly.

Step 6 Verify that all connections to the power supply assembly are intact and the assembly is not damaged. If the power supply assembly is damaged, replace it.

Step 7 Check that connections to the engine controller assembly. If necessary, replace the engine controller assembly.

Step 8 Check fuser connectors, fan and main motor connectors, and the laser/scanner connector.

Troubleshooting with control-panel messages

Control panel lights

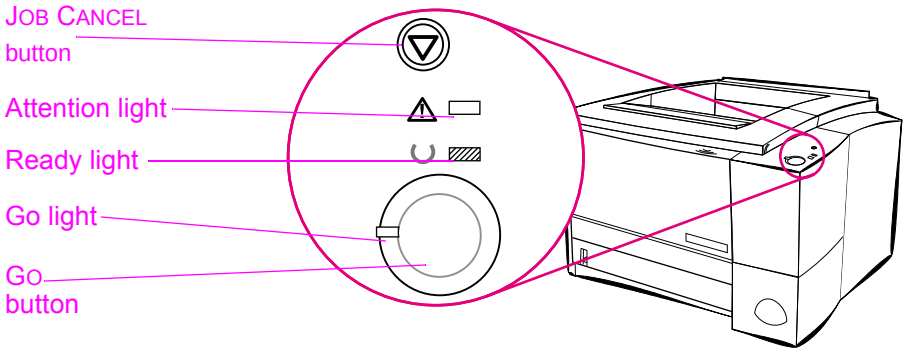


Figure 155. **Control panel layout**

Control-panel light messages

Light patterns provide status and error messages. The lights can be in any one of the following states:

Figure 156. **Light states**

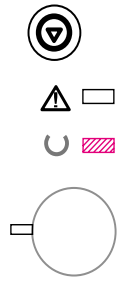
The following control-panel light patterns indicate various conditions of the printer in preparation for, or during, printing. If the Attention light is blinking, the printer is experiencing an error. The messages are grouped according to error type: status, attendance, continuable, fatal, and accessory errors. In many cases the error provides specific information about the defective component.

If the printer lights indicate a continuable, fatal, or accessory error, press GO and JOB CANCEL simultaneously to display additional error information. The lights flash briefly to indicate transitions in error states before displaying the next pattern.

See "Continuable, fatal, and accessory errors" page 184 for secondary information about each of these three types of errors.

Note Secondary information about 79 fatal errors (unrecoverable firmware errors) is not included in the scope of this document. If a 79 fatal error occurs, replace the formatter.

Table 27. Primary status codes

Control-panel light pattern	Primary status message	Recommended action
	Start-up. The Go, Ready, and Attention lights cycle one after another.	• No action is needed. **Note** Pressing GO or JOB CANCEL has no effect until the printer is ready.
	Ready. The Ready light is on and the printer is ready to print.	• No action is needed. **Note** Pressing GO prints a demo page.
	Processing.The printer is receiving or processing data.	• No action is needed. **Note** Pressing JOB CANCEL cancels the current job. One or two pages might print as the printer clears the print job. The printer returns to the ready state after the job is cancelled.
	Attention. The printer requires attention for one of the following reasons: - a door is open - the toner cartridge is missing - print media is jammed in the printer - media supply is depleted	• Pressing GO causes the printer to attempt to clear the jam. It might be necessary to clear the jam manually and push GO or close the top cover.

Continuable, fatal, and accessory errors

Additional information in the form of a secondary error message is available for each of the following three types of errors. The first entry in each of the following tables shows the primary error light pattern. The remaining entries illustrate the secondary error messages. The tables also contain information that typically appears in the status log area of the self test/configuration page.

Table 28. Continuable attention error codes

Control-panel light pattern	Continuable attention error message	Status log code	Recommended action
	Continuable error or tray 1 is out of paper. Pressing GO causes the printer to attempt to recover from the error and print whatever it can. If the recovery is unsuccessful, the printer will return to the continuable error state.		• Press GO to attempt an error recovery and continue printing. • If the error persists, press GO and JOB CANCEL simultaneously to view the secondary continuable error information. See table 29, “Continuable attention error secondary codes” on page 184.

Table 29. Continuable attention error secondary codes

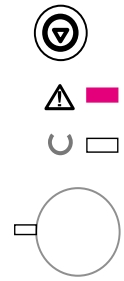
Control-panel light pattern	Continuable attention error secondary message	Status log code	Recommended action
	General continuable error		• Verify that all of the power-supply wire harness connections are connected correctly and fully seated. • Replace the formatter PCB. • Replace the engine controller.
	Memory overflow/memory full (20)	30016	• The printer memory is full. Press GO to resume printing. If you lose some data, try to free some printer memory by removing any unnecessary fonts, macros, or any other data currently in the printer memory. If you continue to lose data, you might need to add more printer memory. For a temporary solution, simplify the image or print at a lower resolution.

Table 29. Continuable attention error secondary codes (continued)

Control-panel light pattern	Continuable attention error secondary message	Status log code	Recommended action
	Temporary engine error (41.x)	30034	• Press Go. The page containing the error will be printed. • If the error persists, reseat the connections to the laser/scanner, formatter, and engine controller. • Replace the laser/scanner. • Replace the formatter. • Replace the engine controller.
	Print overrun (21)	30017	• The print job was too complex for available printer memory. Press Go to resume printing. If you lose some data, you might need to add more printer memory. For a temporary solution, simplify the image or print at a lower resolution.
	Buffer flow error (22)	30027	• Verify that the printer cable is connected properly and fully seated at connections. Always use a high-quality cable. Some non-HP cables might be missing pin connections, or might otherwise not conform to IEEE-1284 specifications. • Replace the formatter
	Bad connection (40)	30018	• The connection between the printer and the EIO card is bad. • Press Go to clear the error message and continue printing. • If the error message persists, turn the printer off and reset the EIO card. Turn the printer on. • Replace the EIO card.

Table 29. Continuable attention error secondary codes (continued)

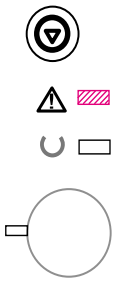
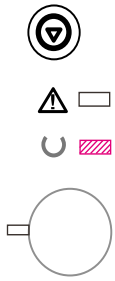
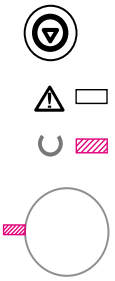
Control-panel light pattern	Continuable attention error secondary message	Status log code	Recommended action
	NVRAM error (68)	30035 or 30036	• A memory error resulted in one or more printer settings being reset to factory defaults. • Print a configuration page and verify that the printer setting are set correctly. • Turn the printer off. Press and hold JOB CANCEL and turn the printer on. Keep JOB CANCEL depressed until all of the Control-panel lights illuminate. Release JOB CANCEL and send the print job again. • Replace the formatter.
	I/O error (81)		• The EIO accessory has encountered a critical error. • Turn the printer off and then on. • If the error message persists, turn the printer off and reset the EIO card. Turn the printer on. • Replace the EIO card.
	Memory configuration error		• Perform a “cold reset”. **Note** If both the Attention and Ready lights come on before you release GO, then you must repeat the procedure. • If the error persists, remove or replace DIMM(s). • Replace the formatter.
	Personality or job-related error	30076	• Perform a “cold reset”. **Note** If both the Attention and Ready lights come on before you release GO, then you must repeat the procedure. • If the error persists, remove or replace language DIMM. • Replace the formatter.

Table 29. Continuable attention error secondary codes (continued)

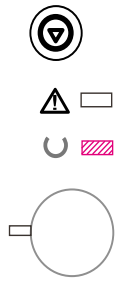
Control-panel light pattern	Continuable attention error secondary message	Status log code	Recommended action
	EIO port error		• Turn the printer off and reseat the EIO accessory. Turn the printer on. • Replace the formatter.
	DIMM slot 1 incompatible error		• Turn the printer off. Reseat DIMM 1. Turn the printer on. • If the problem persists, replace DIMM 1. • Replace the formatter.
	DIMM slot 2 incompatible error		• Turn the printer off. Reseat DIMM 2. Turn the printer on. • If the problem persists, replace DIMM 2. • Replace the formatter.

Table 30. Fatal error codes

Control-panel light pattern	Fatal error message	Status log code	Recommended action
	The printer has experienced an error and cannot recover. All the lights are on.		• View the fatal error secondary codes. • To clear the error, turn the printer off, and then turn it on. If the error persists, turn the printer off for 15 minutes and then turn it on. **Note** Pressing GO and JOB CANCEL shows the fatal secondary error codes.

Table 31. Fatal error secondary codes

Control-panel light pattern	Fatal error secondary message	Status log code	Recommended action
	General fatal error (79)		• Turn power off and back on. • If the error persists, turn off power. Remove all accessories (for example DIMM, EIO card). Turn on the printer. • Replace the formatter. • Replace the engine controller. • Replace the power supply.
	Engine communication error (55)	40055	• A printer error has occurred. Press Go to clear the error message. • Check the connections to the formatter and the engine controller Assembly. • Replace the formatter. • Replace the engine controller. • Replace the power supply.
	Scanner error (52)	40052	• Press Go. The page containing the error will automatically be reprinted. • Turn the printer off and reseat the laser scanner cables. • Replace the laser scanner.
	Bad beam detect error (51)	40051	• Press Go. The page containing the error will automatically be reprinted. • Turn the printer off and reseat the laser scanner cables. • Replace the laser/scanner.
	Scan motor error (57)	40057	• Turn power off and back on. • If the error persists, turn the printer off, reseat the connection between the laser scanner assembly and the engine controller. Turn the printer on. • Replace the laser/scanner. • Replace the engine controller.

Table 31. Fatal error secondary codes (continued)

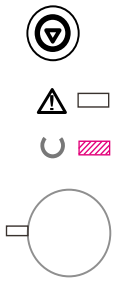
Control-panel light pattern	Fatal error secondary message	Status log code	Recommended action
	Bad fuser error (50)	40050	• Be sure that the fuser is installed correctly and is fully seated. • Reseat the fuser cables. • Replace the fuser. • Replace the engine controller assembly. • Replace the power supply.
	Formatter internal RAM or ROM error		• Turn the printer off, then turn it back on. • Replace the formatter.
	Fan motor error (58)	40058	• Turn the printer off, then turn it back on. • Turn the printer off, then reseat the connection between the fan and the formatter. • Replace the fan. • Replace the engine controller assembly.
	NVRAM error (68)		• Turn the printer off, then turn it back on. • Replace the formatter.
	Scan buffer error (64)	40064	• Turn the printer off, then turn it back on. • If the message persists, replace the formatter.

Table 31. Fatal error secondary codes (continued)

Control-panel light pattern	Fatal error secondary message	Status log code	Recommended action
	RAM controller error (65)	40065	• Turn the printer off, then turn it back on. • Replace the formatter.
	Miscellaneous interface hardware error (67)	40067	• Check the I/O connections. • Verify that the cable is IEEE-1284 compliant (if applicable).

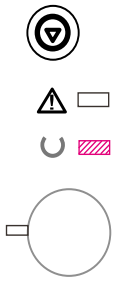
Table 32. Accessory error codes

Control-panel light patterns	Accessory error message	Status log code	Recommended action
	An error has occurred with either the EIO port or the DIMM (memory) slots.		• Press GO and JOB CANCEL simultaneously to view the secondary information. See table 29, “Continuable attention error secondary codes” on page 184 and table 33, “Accessory errors secondary codes” on page 190.

Table 33. Accessory errors secondary codes

Control-panel light patterns	Accessory secondary error message	Status log code	Recommended action
	EIO port error		• Turn the printer off and reseat the EIO accessory. Turn the printer on. • Replace the formatter.

Table 33. Accessory errors secondary codes

Control-panel light patterns	Accessory secondary error message	Status log code	Recommended action
	DIMM slot 1 incompatible error		• Turn the printer off. Reseat DIMM in slot 1. Turn the printer on. • If the problem persists, replace DIMM in slot 1. • Replace the formatter.
	DIMM slot 2 incompatible error		• Turn the printer off. Reseat DIMM in slot 2. Turn the printer on. • If the problem persists, replace DIMM in slot 2. • Replace the formatter.

Print test pages

To confirm that the printer can pick and move print media, generate a self test/configuration page by pressing GO and JOB CANCEL simultaneously when the printer is in a ready state. If the printer cannot produce a self test/configuration page, generate an engine-test page. If an engine-test page does not print, see "Jam troubleshooting" on page 193.

Engine test

The engine test verifies that the print engine is functioning correctly. This test is very useful for isolating printer problems, because it does not involve the formatter. Because the engine test prints a full page of lines across the entire printable area, it is also useful for checking and adjusting registration.

The engine test prints from the first tray found that contains media and can be activated with the formatter installed or removed. See "Engine test" in chapter 3 for engine test procedures.

Note Make sure that the toner cartridge is installed in the printer. Also, the print motor must be idle and the printer must be in standby mode.

In order to produce an engine test print, media must be loaded into the printer. The system checks for media in tray 2, then in tray 1, and finally in tray 3 (if installed). If media is loaded in both tray 1 and tray 2 the media will be duplexed.

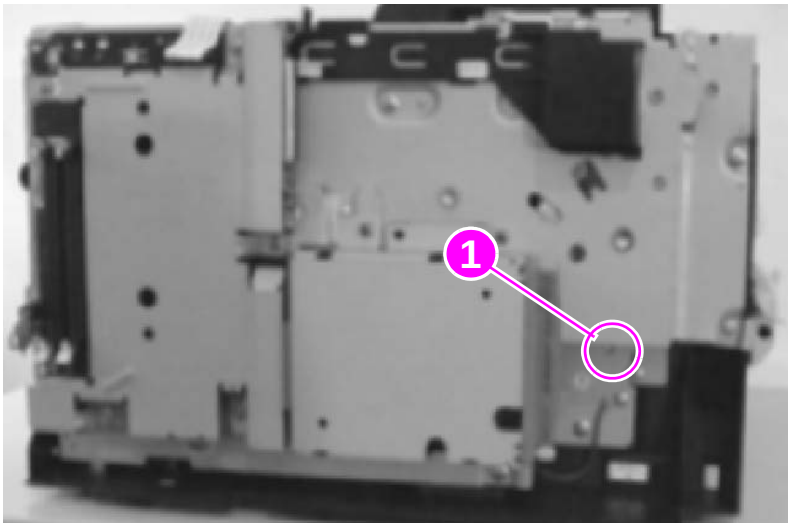


Figure 157. Engine test button

Self test/configuration page

Use the configuration page to view the current printer settings, to help troubleshoot printer problems, or to verify installation of optional accessories such as memory (DIMMs), JetDirect cards, and printer languages. See "Self test/configuration page" in chapter 3 for a sample page.

Note If status log information exists, it will print in the status area of the configuration page. If an HP JetDirect print server EIO card is installed, a JetDirect configuration page will also be generated.

Jam troubleshooting

Jams occur in the printer when print media does not reach or clear a photosensor along the printer paper path within a specific amount of time. The following table contains general questions and topics to explore before troubleshooting.

Table 34. General jam troubleshooting questions

Problem	Action
What is the frequency of the jams (for example: continuous, one jam per 100 pages, one jam per 1000 pages)?	Verify with the customer. See “Troubleshooting with control-panel messages” on page 182 and “Status-log messages” on page 198, and evaluate the Status Log.
Do jams occur with a specific type of media?	Try using media that you know is of good quality. See “Media troubleshooting” on page 209
Where does the leading edge of the first sheet of media in the printer paper path stop when a jam occurs? Are any sheets damaged or torn?	Attempt to duplicate the problem. Inspect the paper path and all paper path mechanical assemblies located before the leading edge of the jam. Use the chapter 3 to aid in locating jams.
Is the customer loading the trays or cassettes correctly?	Observe the customer loading media. Instruct the customer to break the ream, and not to fan the media. See “Media troubleshooting” on page 209
Is the customer overfilling the trays or cassettes?	Observe the customer loading media in the trays or cassettes. Make sure that the media is not over the maximum fill marks in the trays or cassettes.
Are the tray guides set correctly?	Make sure all front and rear tray 2 and optional 250-sheet or 500-sheet feeder guides are set correctly.
Does the printer need cleaning?	Inspect the paper path and paper-path rollers.

Locating and correcting jams

See "Pickup/feed system" in chapter 5 for an account of the operation of the paper-feed system. After reading that section, use the diagrams listed below to locate and troubleshoot the possible causes of the jam.

- See figure 165, “Printer paper path, sensors, and signals,” on page 220.
- See figure 166, “Tray 3 paper path, sensors, and signal lever,” on page 221.
- See figure 167, “General printer-component locations (1 of 2),” on page 222.

The process of correcting jams might be simplified by categorizing jams according to frequency, location, and type of jam. See figure 158, “Frequency of jams process flow,” on page 194 and figure 159, “Location of jams” on page 195.

Frequency of jams process flow

Use the troubleshooting process flow figure to help determine the cause of jams. See figure 154, “Troubleshooting process flow,” on page 180. Jams in the paper path that occur intermittently are most often related to a deficiency in the media or environment. See “Media troubleshooting” on page 209 for information about these defects.

Paper-path jams that occur frequently, and in the same location of the printer, are most likely the result of a hardware problem.

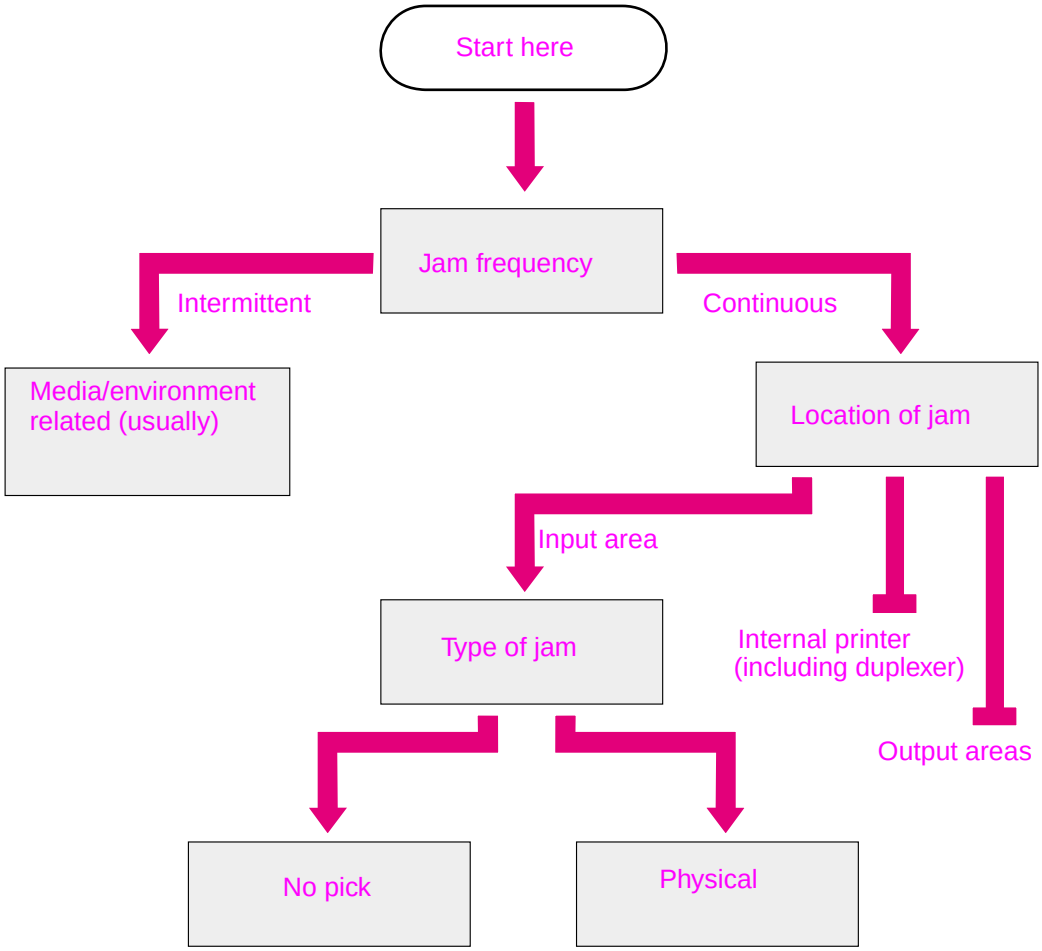


Figure 158. **Frequency of jams process flow**

Location of jams

Frequently occurring jams can be further categorized by their location in the printer. The four major areas of the printer are the input area, the internal area, the duplexer, and the output area. Because the pick-and-feed operation is almost identical for trays 1, 2, and 3, jams in the input area follow the same pattern.

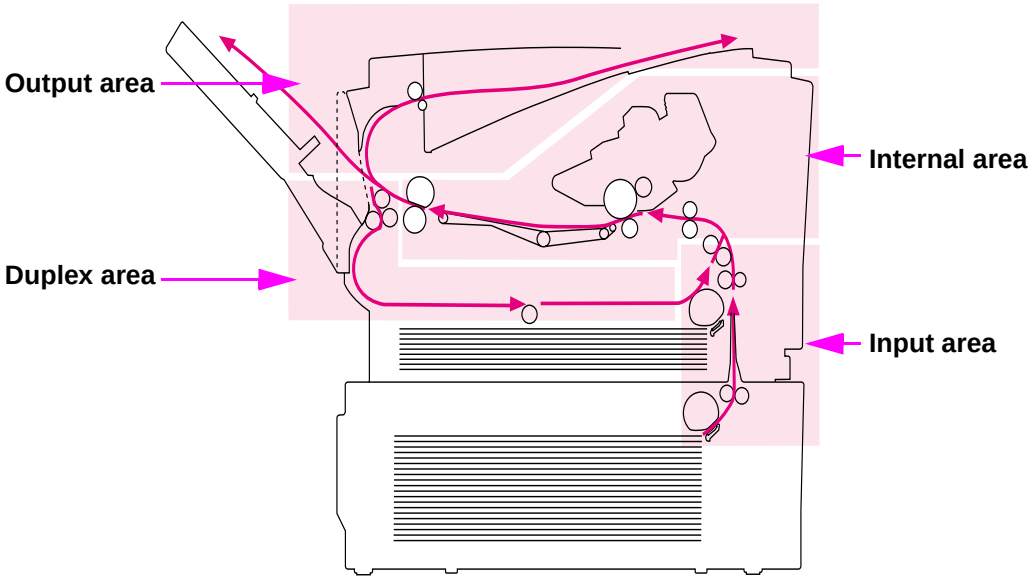


Figure 159. **Location of jams**

Type of jam

Input jams can result from either the failure of the printer to pick the media from a tray, or the failure to move the media through the input area of the printer. Failure to pick up the media can result from either a defect in the pickup roller or in the separation pad.

The following tables summarize the actions for input, internal, duplexer, and output jams.

Table 35. Input jams

Possible cause	Recommended action
Tray photo sensors are blocked or inoperative	Inspect and replace if necessary PS23005 (tray 1) PS1305 (tray 2) PS2001 (250 sheet tray 3) PS2103 (500 sheet tray 3)
Pickup roller is dirty or inoperative	Clean or replace RB2-2900-000CN (tray 1) RB2-2891-000CN (tray 2) RB2-2891-000CN (250-sheet feeder, tray 3) RB2-6304-000CN(500-sheet feeder, tray 3)
Pickup assembly is defective	Replace RG5-4128-000CN (tray 1) RG5-5551-000CN (tray 2)
Separation pad	Inspect and replace if necessary RF5-3272-000CN (tray 1) RB2-6349-000CN (tray 2) RB2-3008-000CN (250-sheet tray 3) RB2-6474-000CN (500-sheet tray 3)
Feed rollers	Inspect and replace if necessary RB2-3490-0000CN (tray 2 and 250-sheet feeder, tray 3) RB2-6476-0000CN (500 sheet feeder, tray 3)
Solenoids	Inspect and replace if necessary SL2901908501 (tray 2) SL2001 (250 sheet tray 3) SL2002 (500 sheet tray 3)
Paper feeder PCB (250-sheet tray 3) is defective Paper feeder PCB (500-sheet tray 3) is defective	Replace RG5-4277-000CN (250 sheet tray 3) Replace RG5-5630-000CN (500 sheet tray 3)
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Table 36. Internal jams

Possible cause	Recommended action
Tray photo sensors are blocked or inoperative	Inspect and replace if necessary PS23005 (tray 1) PS1305 (tray 2) PS2001 (250-sheet tray 3) PS2103 (500-sheet tray 3)
Registration assembly is defective	Replace RG5-5556-000CN
Transfer Roller assembly is defective	Replace RG5-5581-000CN
Toner cartridge is defective	Inspect and replace if necessary C4096A
Transport assembly is defective	Inspect and replace if necessary RB2-6272-000CN (belt) RB2-6272-000CN (belt)

Table 36. Internal jams (continued)

Possible cause	Recommended action
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)
Fusing assembly is defective	Replace (includes PS2301) RG5-5559-000CN (110 V) RG5-5569-000CN (220 V)

Table 37. Duplex jams

Possible cause	Recommended action
Unlatched duplexer tray	Latch duplexer tray
Reverse-paper sensor Duplexer pickup paper sensor	Replace PS501 Replace PS503
Position guide assembly	Replace RG5-5553-000CN
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Table 38. Output jams

Possible cause	Recommended action
Fusing assembly is defective	Replace (includes PS503) RG5-5559-000CN (110 V) RG5-5569-000CN (220 V)
Upper/lower face-down delivery rollers	RG5-5541-000CN RG5-5542-000CN RF5-3275-000CN
Engine controller PCB	Replace RG5-5567-000CN
Power supply assembly	Replace RG5-5563-000CN (110 V) Replace RG5-5573-000CN (220 V)

Media problems

If jams persist, even when the print engine is fully functional, the problem might be with the quality and type of media being used. See “Media troubleshooting” on page 209

Evaluate the test pages

Status-log messages

Use the status log to diagnose and troubleshoot intermittent printer errors, or to gain information about multiple error conditions that occur simultaneously. You can either display or print the event log.

Status log information prints automatically on the self test/configuration page. The status log retains the printer's last 10 error messages. (The status log only appears when errors have been registered.)

Status-log messages are listed in "Control-panel light messages" on page 182, according to their corresponding error light configuration. For a complete listing of status codes, see the *HP LaserJet 2200 series printer software technical reference,* (C7058-90937). The complete PJL status code listing is contained in the appendix of the printer job language technical reference. Also refer to Hewlett-Packard's website: www.hp.com.

Hint If the message requesting that you load a tray persists, or if a message indicates that a previous print job is still in the printer's memory, press GO to print or press JOB CANCEL to clear the job from the printer memory.

Verify installed options

Verify all options installed in the printer are reflected in the configuration page. If an installed device is not shown, reseat the device and print a new configuration page.

Image-formation troubleshooting

When working with customers, obtain a print sample before troubleshooting the printer. Ask the customer to describe the quality expected from the printer. The print sample also helps clarify the customer's description of the problem.

Often an image-formation problem can be linked to media that is outside the specifications Hewlett-Packard has established for optimum printer performance. See “Media troubleshooting” on page 209 for help with persistent image-formation problems.

Table 39. Image-quality checks

Image-quality checks	Action
Does the problem repeat on the page?	Use the “Repetitive defect ruler” on page 207.
Is the toner cartridge full and is it manufactured by HP?	See “Check the toner cartridge” on page 200.
Is the customer using print media that meets all HP specification standards?	See "Media specifications" in chapter 2.
Is the print sample similar to those in the image defect tables?	Compare the sample to the tables and perform the actions recommended in the “Image defect tables” on page 201.
Is the problem on the toner cartridge or the transfer roller?	Perform the “Half self test functional check” on page 208 to determine the location of the defect. If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing—See "Image formation system" in chapter 5), and troubleshoot the failure as a transfer or fusing problem.
Is the customer using a media type recommended for this product?	See “Media troubleshooting” on page 209.

Check the toner cartridge

Image-formation defects are often the result of problems with the toner cartridge. Use the following list to verify that the toner cartridge is still operating correctly.

Perform all of the following checks before replacing the toner cartridge.

- Verify that the toner cartridge has toner. The full toner cartridge weight is approximately 1105 grams; empty weight is approximately 900 grams.
- Check the toner cartridge to see if it has been disassembled or refilled.
- Verify that the toner cartridge is seated properly in the printer cavity.
- Inspect the cartridge for toner leaking through worn seals. (Manual rotation of the drum can caused internal damage and toner spills can result.)
- White areas on the page can indicate the drum has been exposed to light for too long.

Note The toner cartridge is rated for 5,000 images at 5 percent coverage. Check the surface of the photosensitive drum in the cartridge to see if it has been damaged or scratched. Touching the drum will contaminate the photosensitive surface and may cause spotting and defects during printing.

EconoMode

EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50 percent. Advise the customer to turn EconoMode on or off either from the printer driver or a software application.

CAUTION Hewlett-Packard does not recommend full-time use of EconoMode. If EconoMode is used full-time, it is possible the toner supply will out last the mechanical parts in the toner cartridge.

Image defect tables

The printer output quality is subject to user judgment. This section of the manual helps define print-quality defects and the factors that affect print quality.

The print samples shown in the following figures illustrate some print-quality defects. Keep copies of print-quality defects you encounter in the field and an explanation of their causes to use for future reference.

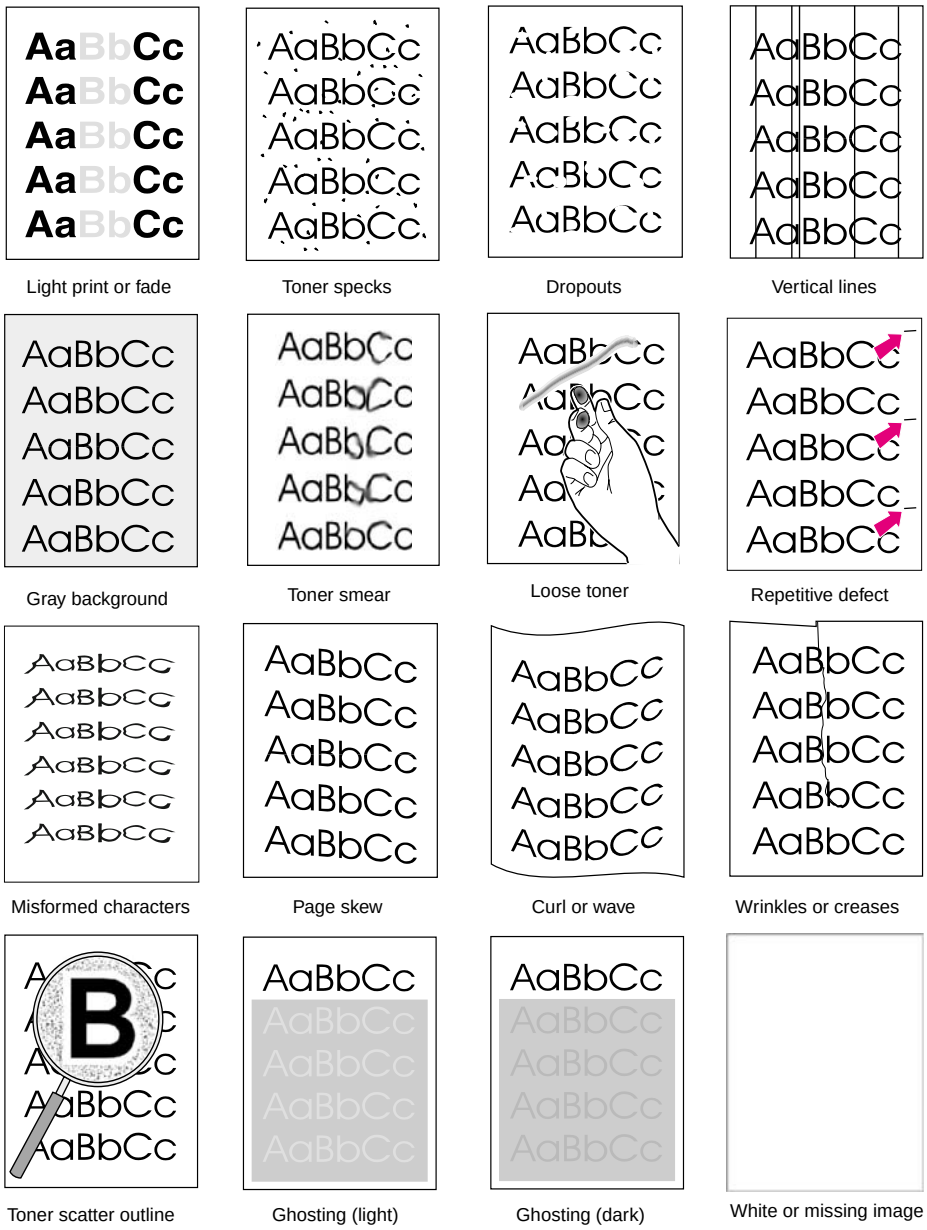


Figure 160. **Image defects examples**

Table 40. Image defects

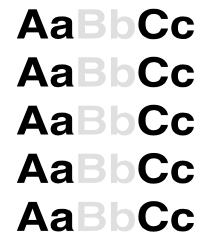
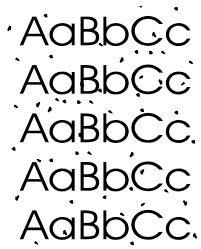
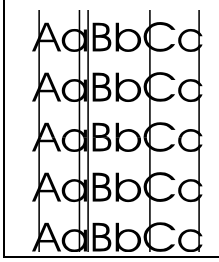
Problem	Cause	Solution
Light print, or fade 	Wrong toner density setting.	• Through the software, adjust the toner density setting. Make sure EconoMode is off.
	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the media and advise the customer to use the recommended print media and store it properly.
	The toner supply is low	• Temporarily extend the toner cartridge life by redistributing the toner. • If this does not improve the print quality, install a new toner cartridge.
Toner specks 	The transfer roller is dirty.	• Clean the inside of the printer or use the printer's cleaning page.
	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the media and advise the customer to use the recommended print media and store it properly.
	The paper path is dirty.	• Clean the inside of the printer or use the printer's cleaning page.
Dropouts	Single sheet of paper is defective.	• Try to reprint the job.
	Moisture content of the paper is uneven or the paper has moist spots on it.	• Try paper from a different source.
	Paper lot is bad.	• Try a different kind or brand of paper.
	The toner cartridge might be defective.	• Check vertical repetitive defects. • Replace the toner cartridge.
Vertical lines 	Defective toner cartridge.	• Replace the toner cartridge.
	Contaminated fuser entrance guide.	• Clean the guide.
	Scratches on the fuser.	• Replace the fuser.

Table 40. Image defects (continued)

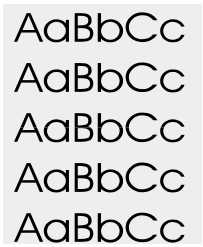
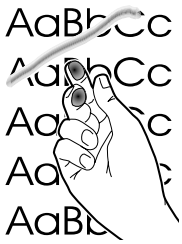
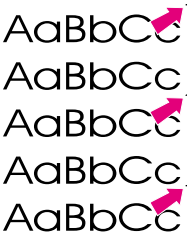
Problem	Cause	Solution
Gray background 	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the paper.
	Printer's operating environment does not meet specifications.	• Make sure the printer's operating environment meets specifications.
	Wrong toner density setting.	• Through the software, adjust the toner density setting. Make sure EconoMode is off.
	Faulty toner cartridge.	• Replace the toner cartridge.
Toner smear 	Contamination in the printer.	• Print a few more pages to see if the problem corrects itself. • Clean the inside of the printer or use the printer's cleaning page.
	Paper might be too smooth.	• Check the paper (or other print media) type and quality.
	Defective toner cartridge.	• Replace the toner cartridge. (See instructions with the toner cartridge.)
	Wrong fuser setting for paper type.	• From the control panel, change the fuser mode setting or choose another paper type from the printer driver.
Loose toner 	Contamination in the printer.	• Print a few more pages to see if the problem corrects itself. • Clean the inside of the printer.
	Toner cartridge is defective.	• Replace the toner cartridge.
	Paper might be too smooth.	• Check the paper (or other print media) type and quality.
	Defective fuser.	• Replace the fuser.
Repetitive defects 	Contamination or defect on internal parts.	• Try printing additional pages. • Clean the inside of the printer.
	Toner cartridge is damaged.	• See the "Repetitive defect ruler" on page 208. • Replace the toner cartridge.
	Defective fuser.	• Replace the fuser.

Table 40. Image defects (continued)

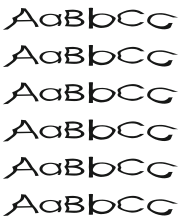
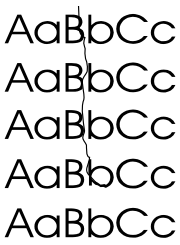
Problem	Cause	Solution
Misformed characters 	Maintenance due.	• Print a few more pages to see if the problem corrects itself. • Make sure that the environmental specifications for the printer are being met. • Print a demo page to verify that the problem persists. • Perform maintenance actions as required.
	Paper might be too smooth.	• Check the paper (or other print media) type and quality.
Page skew 	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Verify that there are no torn pieces of media inside the printer. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the media.
	Print media is not loaded correctly or trays are not adjusted properly.	• Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Registration assembly is improperly installed.	• Be sure that the registration assembly is installed correctly.
Curl or wave 	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the media.
	Printer's operating environment does not meet specifications.	• Make sure the printer's operating environment meets specifications.
	Wrong output bin.	• Print to a different output bin (top or rear output bin).
Wrinkles or creases 	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet hp specifications, replace the paper.
	Print media is loaded incorrectly.	• Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Wrong tray.	• Print from a different tray (such as tray 1).
	Wrong output bin for print media type.	• Print to a different output bin (top or rear output bin).

Table 40. Image defects (continued)

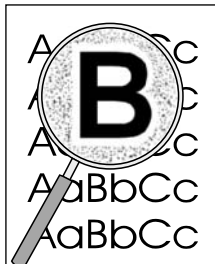
Problem	Cause	Solution
Toner scatter outline 	Print media does not meet printer specifications or is stored improperly.	• Print a few more pages to see if the problem corrects itself. • Turn over the stack of media in the tray. Also try rotating the media 180 degrees. • If the print media does not meet HP specifications, replace the paper.
	Maintenance due.	• Print a few more pages to see if the problem corrects itself. • Print a demo page to verify problem persists. • Perform maintenance actions as required.
Ghosting (light)	This type of defect might occur when using preprinted forms, a large quantity of narrow media, or a fuser mode that is set too high for your media.	• Print a few more pages and see if the problem corrects itself. • Make sure that print media type and quality meet HP specifications. • If the defect occurs later in a print job, turn the printer off for ten minutes, and then turn the printer on to restart the print job. • Check your fuser mode.
Ghosting (dark)	This type of defect might occur when using preprinted forms, a large quantity of narrow media, or a fuser mode that is set too high for your media.	• Print a few more pages and see if the problem corrects itself. • Make sure that print media type and quality meet HP specifications. • If the defect occurs later in a print job, turn the printer off for ten minutes, and then turn the printer on to restart the print job. • Check your fuser mode.

Table 40. Image defects (continued)

Problem	Cause	Solution
White or missing image	No toner is available for print.	• Remove sealing tape or replace the toner cartridge.
	Defective laser shutter.	• Check that the laser shutter operates freely when the toner cartridge is installed.
	Toner cartridge guide damaged, improperly positioned, or missing.	• Make sure the guide is installed properly above the toner cartridge.
	No transfer roller voltage.	• Without transfer roller voltage, toner cannot be attracted from the surface of the drum to the print media. Perform the half self test functional check to check all other electrophotographic processes. See “Half self test functional check” on page 208. Replace the transfer roller if necessary.
	No developing bias.	• Clean the high-voltage power supply contacts. With no developing bias charge, toner is not attracted to the drum. • Replace the power supply.
	No drum ground path.	• With no ground path, the drum cannot discharge. The negative charge on the drum repels toner, and leaves a white page with bubble print. • Check the drum ground spring and reconnect it, if necessary. • Replace the power supply PCB.
	Defective laser scanner cable assembly.	• Low-level signals exchanged between the laser/scanner assembly and the engine controller PCB might be affecting laser output. Replace the laser/scanner cable assembly.

Repetitive defect ruler

Repetitive print defects are usually caused by a specific roller in the printer or the toner cartridge. Use the figure below to isolate the cause of repetitive print defects. Align the first occurrence of the defect with the top of the “ruler” (at the top or bottom of the misprinted page), and measure to the next occurrence of the defect to determine the roller in question. When the defect pattern matches the pattern of the ruler, replace the indicated roller.

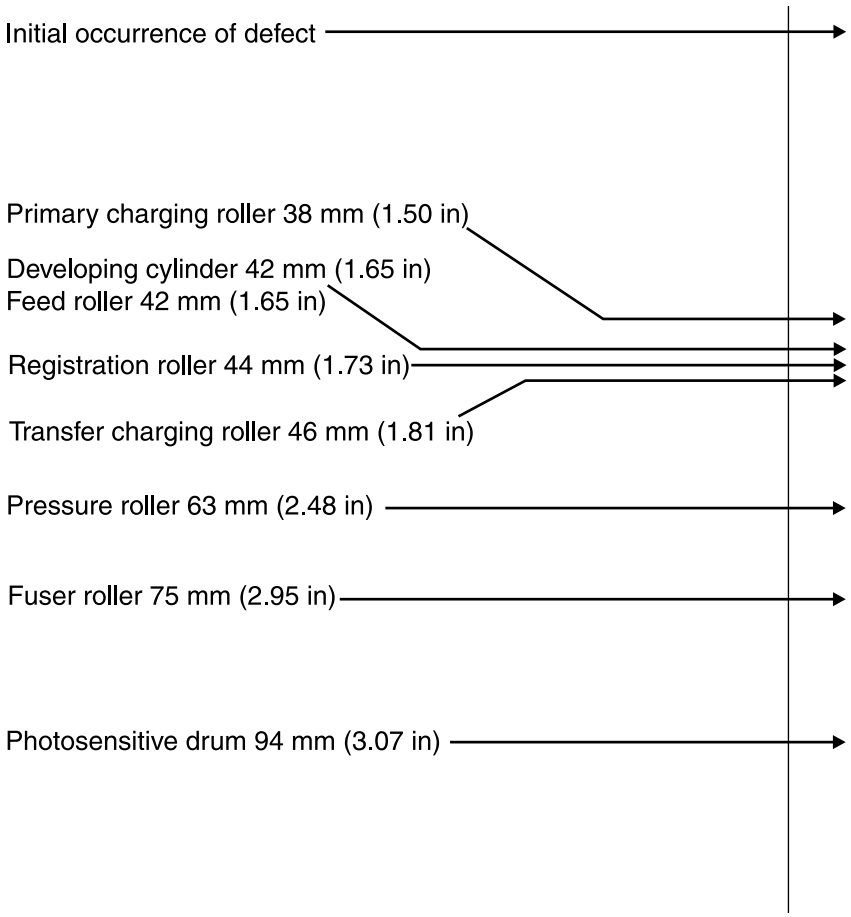

Initial occurrence of defect
Primary charging roller 38 mm (1.50 in)
Developing cylinder 42 mm (1.65 in)
Feed roller 42 mm (1.65 in)
Registration roller 44 mm (1.73 in)
Transfer charging roller 46 mm (1.81 in)
Pressure roller 63 mm (2.48 in)
Fuser roller 75 mm (2.95 in)
Photosensitive drum 94 mm (3.07 in)

Figure 161. **Repetitive defect ruler**

Half self test functional check

The electrophotographic process can be subdivided into the following stages:

- Cleaning (removes excess toner from drum surface)
- Conditioning (places a uniform electrical charge on drum)
- Writing (laser strikes surface of drum to create latent image)
- Developing (forms the toner image on drum)
- Transferring (charges transfer the image to paper)
- Fusing (heat and pressure produces a permanent image)

The purpose of the half self test check is to determine which process is malfunctioning. Perform the test as follows:

Step 1 Print a configuration page from tray 1.

Step 2 Open the top cover after the trailing edge of the paper enters the printer. At this point, the leading edge of the paper should have advanced beyond the toner cartridge.

Step 3 Remove the toner cartridge.

Step 4 Open the toner cartridge drum shield to view the drum surface.

If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing) and troubleshoot the failure as a transfer or fusing problem.

If no image is present on the photosensitive drum, perform the drum rotation functional check.

Drum-rotation functional check

The photosensitive drum, located in the toner cartridge, must rotate for the print process to work. The photosensitive drum receives its drive from the main drive assembly. To verify whether the drum is rotating:

1. Open the top cover.
2. Remove the toner cartridge.
3. Mark the cartridge drive gear with a felt-tipped marker. Note the position of the mark.
4. Install the toner cartridge and close the top cover. The start-up sequence should rotate the drum enough to move the mark.
5. Open the printer and inspect the gear that was marked in step 3. Verify that the mark moved. If the mark did not move, inspect the main drive assembly to make sure it is meshing with the toner cartridge gears. If the drive gears function and the drum does not move, replace the toner cartridge.

Note This test is especially important when the customer is using refilled toner cartridges.

Media troubleshooting

Media defects can cause jams and image defects. If the previously described conditions are corrected and do not eliminate the printing problem, continue to investigate the media as the source of the defect.

Problems with print media are sometimes difficult to detect. Follow a standard troubleshooting procedure to help isolate media-related problems. The steps to follow are:

- “Determine the problem source: print media or printer” on page 209.
- “Isolate a paper path” on page 209.
- “Isolate a media brand” on page 210.
- “Isolate a media type” on page 211.
- “Evaluate media use practices” on page 215.
- “Evaluate environmental conditions” on page 215.

Determine the problem source: print media or printer

When determining the cause of a printer failure, a distinction must be made between problems that relate to the printer itself and those that involve print media. Often a problem that seems to be related to the printer is actually a matter of poor print-media selection or handling. To determine if a problem is caused by the printer or by the media, try a few simple steps to remedy the situation:

- Turn media over in the tray to print on the reverse side.
- Rotate sheets 180 degrees (end to end) to feed with a different leading edge.

If the symptoms cease, or change in some way, it can be assumed that the problems are caused by the print media.

Isolate a paper path

Try using the straightest paper path

Some problems can be avoided by using the straightest available paper path. Usually this means paper feeds from the upper paper tray or manual feeder, and exits into the rear output bin (if available). This path is recommended for envelopes and media with a heavy basis weight.

Determine if the problem is caused by duplexing

Paper that has just made a pass through the printer can show increased media curl. Media curl increases image dropout, and creates pickup and stacking problems. When the second pass is made, print media might not meet the specifications for moisture and curl. Dry paper can hold static charges that affect print quality and stacking of the duplexed page. Media shrinkage resulting from a second pass through the printer can cause image misalignment on the duplexed page.

Isolate the source of the jam

Define the source of the media that is jamming:

- tray 1
- tray 2
- tray 3 (250-sheet or 500-sheet)
- duplexer

Determine where media jams occur

Check where media stops when a jam occurs. Types of jams include:

- input paper jams
- internal paper-path jams
- duplexer
- output-bin jams

Determine whether the printer is experiencing misfeeds or multifeed jams

The following are some possible causes of misfeeds or multifeed jams:

- The media might be too stiff. Check basis weight and measure caliper. See "Basis-weight field test" in chapter 9 and "Caliper field test" in chapter 2.
- The paper might be too smooth. Check the finish.
- The paper might be too heavy or too light. Check basis weight.
- The customer might be attempting to print embossed paper, pre printed forms, or perforated paper that does not meet HP specifications. See “Isolate a media brand” on page 210 below or details about issues involved in printing on embossed paper.
- The paper might be loaded incorrectly. Turn over the sheets in the paper tray to determine if in-ream curl is causing misfeeds.
- The customer might be fanning media before loading it into the tray.
- The customer might be adding media in small amounts. Do not add small amounts of media or mix types of media in the tray.
- The printer or media storage environment might be too humid or too dry. (As a result, media might be too moist or too dry.) Determine if this is the case and advise the customer.

Isolate a media brand

If the printer jams with only one brand of media:

- Try switching media brands.
- If the paper ream in use appears to be old, open a fresh ream of the same paper and load it properly into the printer. If the problem disappears, investigate storage and handling conditions.

Isolate a media type

When jams and other problems occur frequently, it is often because the customer is using a special paper. Customers must only use print media that conforms to all Hewlett-Packard specifications, and should always test media before purchasing large quantities. Media should be tested before storage to verify quality printing results. Then, if problems arise, storage or handling conditions can isolate the most likely cause. Some types of media that might cause problems are:

- preprinted forms and special letterhead
- embossed paper
- perforated paper
- adhesive labels
- envelopes
- transparencies
- chemically treated paper
- synthetic paper
- coated paper
- other special media

Preprinted forms and special letterhead

Many preprinted forms and special letterhead papers perform well in HP LaserJet printers. However, these papers undergo processes that alter their original characteristics, and care must be taken to ensure they conform to HP specifications. All special papers should be wrapped in moisture-proof wrapping when purchased from the paper converter or printing house.

Forms and letterhead must be printed with inks that conform to the following specifications:

- Only use ink that is heat-resistant, and that will not melt, scorch, or release hazardous emissions when subjected to 200 degrees C (392 degrees F) for 0.1 second.
- Inks must have resistance to silicon oils, and must not be affected by resin components in toner.
- Inks must not be flammable.
- Inks must not “offset” (transfer from the printed paper onto the printer, contaminating internal printer components). The principle cause of offset is ink that is not fully dried or that cannot withstand the printer fusing temperature.

Note Do not use low-temperature inks (the kind used with thermography).

Hint Do not purchase more media than can be easily used in a short time (about 3 months). Media stored for long periods experiences heat and moisture extremes that can be damaging. Planning is important to prevent damage to a large supply of media.

Hewlett-Packard neither warrants nor recommends the use of a particular brand of paper or print media. Media properties are subject to manufacturing changes, and Hewllett-Packard has no control over such changes. The customer assumes all responsibility for the quality and performance of media. Although testing media helps to characterize its performance, process quality control by the manufacturer.

Embossed media

Embossed media is not recommended for use in HP LaserJet printers. Media is embossed by stamping an image into the media by compressing the media fibers together at approximately 200 degrees C (392 degrees F), and sometimes by applying a thin metal foil to the surface. The printer fusing process can loosen the foil; loose foil can interfere with the mechanical and electronic operation of the printer.

Embossed paper, with or without foil, can also cause multifeed jams. Multiple embossed print media sheets tend to stick to one another.

Media with cutouts or perforations

Avoid media with cutouts or perforations for these reasons:

- Cut fibers absorb more moisture and can increase waviness and media curl. This decreases the print quality near the cutout or perforated area.
- The cutting knife leaves a sharp edge on the cutout or perforation. If this sharp edge is facing the toner cartridge drum during printing it can scratch the drum surface.
- If printing occurs over a cutout hole the transfer roller is contaminated with unused toner. Light streaks can result on the paper from the contaminated roller.

Adhesive labels

Labels are defined as media with a pressure-sensitive adhesive backing. Label stock includes the top sheet, the adhesive, and the carrier sheet (also referred to as the backing). To prevent media jams and feed problems, always use the rear output tray when printing on labels. You must use the following guide lines when using labels:

- Labels must be cut long grain (as opposed to short grain).
- Labels must totally cover the carrier sheet (no spaces between the labels).
- Labels must contain only acrylic-based adhesives.
- Labels must contain no excessive adhesive. (Adhesive from some labels can cause jamming resulting from buildup in the printer mechanism. The adhesive should not come into direct contact with the printer at any time.)
- Labels must meet Hewlett-Packard specifications for fusing compatibility.
- Labels must meet Hewlett-Packard specifications for caliper.
- Labels must have a carrier sheet that is not too smooth (which can cause the feed rollers to slip).

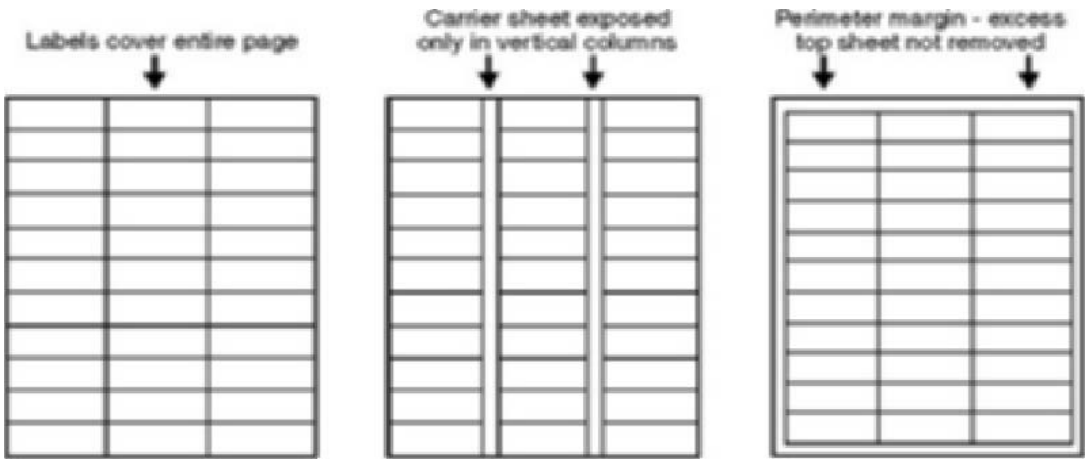

Labels cover entire page
Carrier sheet exposed only in vertical columns
Perimeter margin - excess top sheet not removed

Figure 162. **Adhesive labels**

Envelopes

Because of the variety of folds and cuts available it is difficult to specify the types of envelopes that will perform well with HP LaserJet printers. It is very important to test a sample envelope before purchasing a large quantity. The specifications for media also apply to envelopes. Avoid envelopes that contain contact adhesives.

Following are a few recommendations for feeding envelopes:

- Closely inspect the leading edge of the envelopes before feeding them into the printer. Verify the leading edge is flat. Watch for envelope curl and loose folds. If necessary, flatten the leading edge of the envelope before feeding.
- Be patient! In manual-feed mode, the printer displays a message when prepared to accept the next envelope. Always wait for this message to appear before loading or feeding envelopes into the printer.
- Do not allow a large quantity of envelopes to accumulate in the output tray. If too many envelopes accumulate, they can interfere with the output path.
- Use the rear output tray when printing envelopes.

The main causes of problems with envelopes on HP LaserJet printers are:

- folds (two or more thicknesses of paper)
- edge creases (sharp or rounded)
- glued edges (sealing when fused)
- uneven printing surfaces

For fewer problems, follow these guidelines:

- Corner folds must be well-creased, and contain no more than two thicknesses of paper.
- Envelopes must lie flat.
- Paper grain should be diagonal.
- Adhesives must meet HP specifications for fusing compatibility.
- Basis weight must not exceed 11 kg (28 lb).
- Under no circumstances should envelopes have clasps, snaps, or windows, or use synthetic materials. Severe damage to the printer can result.

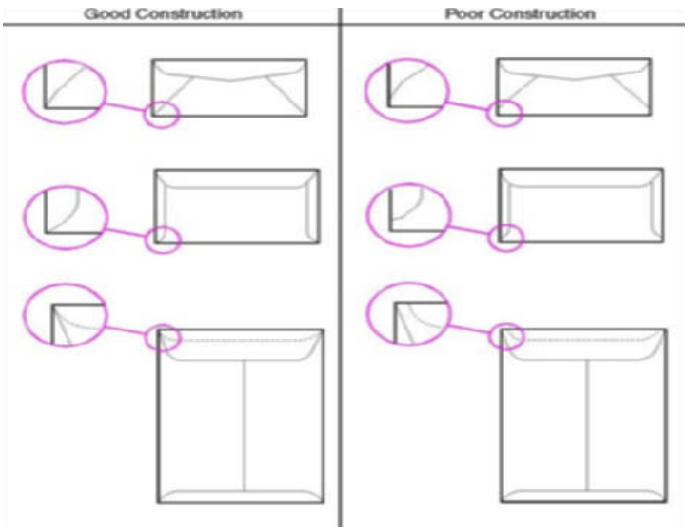


Figure 163. **Envelope sample**

Transparencies

Printing on transparencies presents a special set of challenges. The surface resistance of a transparency can be infinite, causing the transparency to act like paper with 0 percent moisture content. This can result in streaks and smudging. Static charges can accumulate on some transparent stock and cause multifeed jams. Also, certain brands and types of transparencies do not tolerate exposure to the fuser.

The user should only select transparencies that meet HP specifications. Among the common precautions are:

- Print transparencies to the top output bin to avoid jams.
- Transparencies must have correct resistivity (not built-up static charge).
- Transparencies must meet HP specifications for fusing compatibility.
- Each sheet should be removed from the tray and placed on a flat surface before printing the next sheet. This will keep the toner form rubbing off from the one sheet to the sheet before it has had time to cool.

Chemically treated media

Coatings such as lacquers, polymers, laminations, or other chemicals protect the paper but can cause problems in the fuser and transfer areas of Hewlett-Packard LaserJet printers. The surface resistivity and moisture content can be greatly altered, resulting in print-quality problems. Hard surface coatings increase wear on the rollers and media guides. All chemically treated media must meet Hewlett-Packard specifications for fusing compatibility.

Synthetic media

Synthetic medias (those manufactured from man-made fibers) do not perform as well as bond media in any printer, especially Hewlett-Packard LaserJet printers. All synthetic media must meet Hewlett-Packard specifications, especially for caliper and fusing compatibility.

Coated media

Do not use coated media. Most coated media does not meet specifications for fusing compatibility and other specifications for HP LaserJet printers.

Other special media

1. Odd sizes. Check minimum and maximum supported sizes in chapter 2.
2. Carbonless media. No carbon required (NCR) media is not supported by HP LaserJet printers.
3. Recycled media. Choose recycled media that meets Hewlett-Packard specifications. Note that recycled media might not be as bright as indicated in the specifications. Hewlett-Packard recommends that recycled media contain no more than 5 percent groundwood. See chapter 2 for testing information.

Evaluate media use practices

Handling and loading

Often differences in techniques, missed steps, or media-handling methods are responsible for problems. Be sure the media is loaded correctly in the printer.

Note Make sure that all printer users are observing these guidelines.

Printer maintenance

General cleanliness of the printer is the most important part of printer maintenance. Printers using media that creates a lot of dust and debris might require an aggressive maintenance schedule. Media dust accumulates in the following areas:

- pickup rollers
- media guides

Take extra time to clean and inspect the paper path. If problems continue after cleaning, inspect for wear or damage.

Media stacking

Consider the following guidelines when advising the customer about stacking media:

- Do not store cartons of reams directly on the floor; cartons should be placed on a pallet or on shelves.
- Do not stack cartons more than six on top of one another.
- Stack each carton squarely on top of the other.
- Stack each carton upright.
- Do not store individual reams in such a manner that they will curl or warp along the edges.
- Do not place anything on top of stored media.
- Do not place the media close to heating or air conditioning vents or open windows.

Evaluate environmental conditions

Printing environment

Ideally, the printing environment should be at room temperature and not too dry or too humid. Print media absorbs and loses moisture rapidly.

Temperature extremes and excessive humidity can damage print media. Heat causes the moisture in the media to evaporate. Cold causes the moisture in the media to condense. Heating systems and air conditioners remove most humidity. When media loses moisture, streaks and smudging result. When paper absorbs moisture, light print and dropouts result.

Media storage environment

Media storage environmental conditions directly affect the feed operation.

Hint

Do not purchase more media than can be easily used in a short time (about 3 months). Media stored for long periods experiences heat and moisture extremes that can be damaging. Planning is important to prevent damage to a large supply of media.

Hewlett-Packard neither warrants nor recommends the use of a particular brand of paper or print media. Media properties are subject to manufacturing changes Hewllett-Packard has no control over such changes. The customer assumes all responsibility for the quality and performance of media. Although testing media helps to characterize its performance, process quality control by the manufacturer.

Unconverted media in sealed reams can remain stable for several months before use. Converted media has greater potential for environmental damage, especially if it is not wrapped with a moisture-proof barrier.

The media storage environment should be properly maintained to ensure optimum printer performance. The required condition is 20 degrees to 24 degrees C (68 degrees to 75 degrees F), with a relative humidity of 45 percent to 55 percent. The following guidelines should be considered when evaluating the customer's media storage environment:

- Media should be stored at or near room temperature.
- The air should not be too dry or too humid.
- The best way to store an opened ream of paper is to rewrap it tightly in its moisture-proof wrapping. If the printer environment is subject to extremes, unwrap only the amount of media to be used during the day's operation to prevent unwanted moisture changes.

Communication troubleshooting

Communications check

Note Communication problems are normally the customer's responsibility. Time spent attempting to resolve these problems might not be covered by the Hewlett-Packard warranty.

Refer the customer to the network administrator for assistance in troubleshooting network problems.

Test message

After the printer is installed, verify communications between the printer and the IBM-compatible computer. Enter the following at the DOS prompt:

`C:\DIR>LPT1` ENTER (for printing to parallel port #1)

The printer should print a directory listing of the C: \ directory.

EIO troubleshooting

See "JetDirect configuration" on page 219 for information regarding the current status of the EIO accessories. Before attempting to troubleshoot a network problem or notifying the network consultant of a problem, always print a configuration page.

See the *HP JetDirect Print Server Software Installation Guide* for detailed explanations of network issues (go to http:/www.hp.com/go/JetDirect).

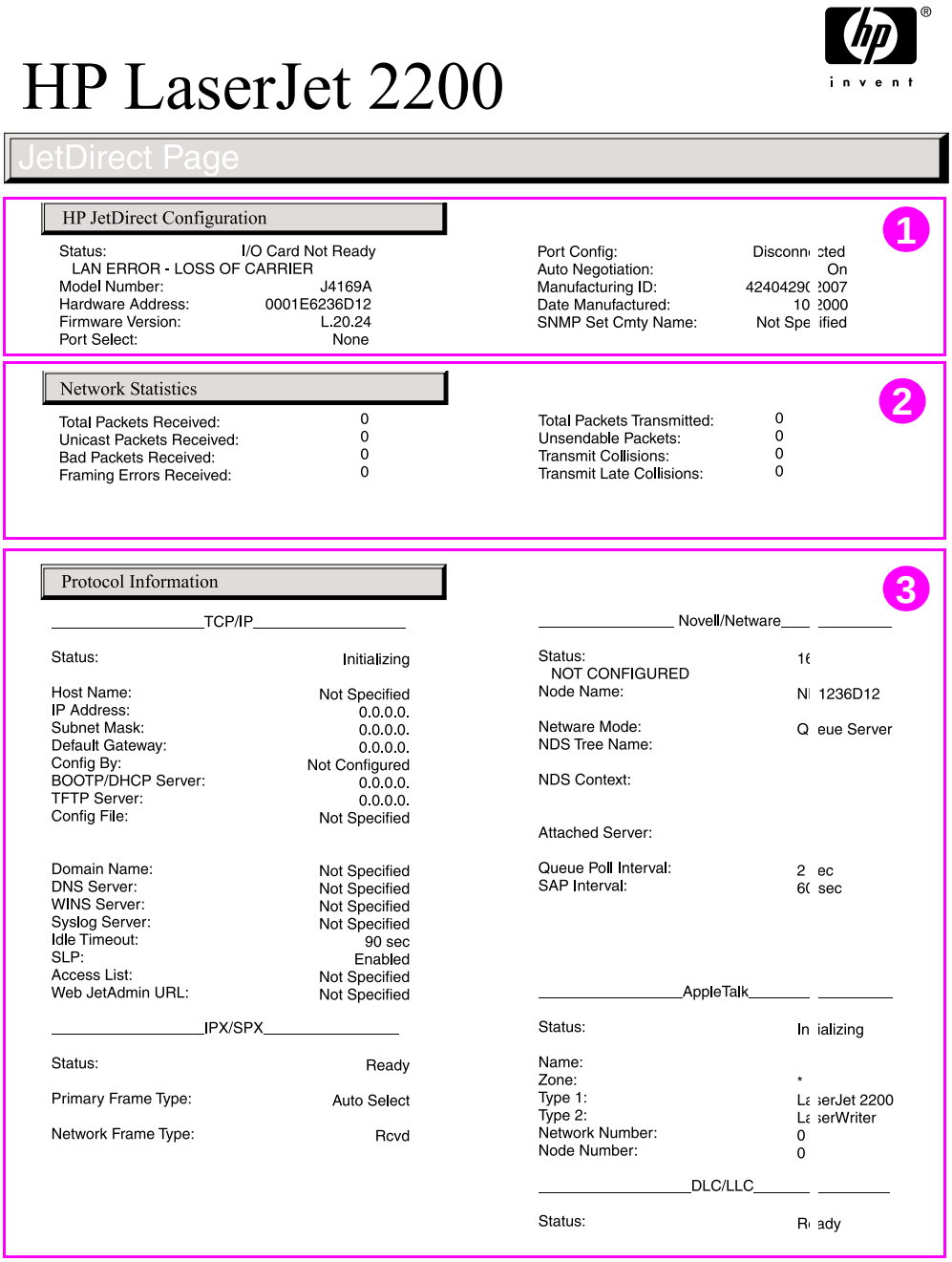


Figure 164. **JetDirect configuration page**

JetDirect configuration-page elements

1 **General information** lists the HP JetDirect number, firmware revision, LAN hardware address, selected port, manufacturing ID, I/O card status, and network statistics (unicast packets, total packets, bad packets, framing errors received, packets transmitted, unsendable packets, transmit collisions, and transmit late collisions).

2 Network statistics lists total packets received, unicast packets received, bad packets received, framing errors received, total packets received, unsendable packets, transmit collisions, transmit late collisions.

3 **Protocol information** lists TCP/IP status and configuration, the HP Web JetAdmin server name, Novell NetWare status and configuration, AppleTalk status and configuration, and DLC/LLC status.

JetDirect configuration

- If the EIO JetDirect card has started successfully and completed its internal diagnostics, the I/O CARD READY message appears on the JetDirect configuration page. If communication is lost, an I/O NOT READY message appears followed by a two-digit error code. See the *HP JetDirect Network Interface Configuration Guide* for further details and recommended action (go to http:/ www.hp.com/go/JetDirect).
- The “Network Statistics” column indicates that network activity has been occurring. Bad packets, framing errors, unsendable packets, and collisions should be minimal. If a high percentage (greater than one percent) of these occur, contact the network administrator. All of the statistics are set to zero when the printer is turned off.
- The “Novell Status” block should state the Novell printer server name to which the printer is connected. If the node name reads “NPIxxxxxx” (xxxxxx=last six digits of the EIO’s LAN address), the EIO card has not been configured for a Novell server. This could indicate that the card is operating under an IPX protocol other than Novell. Consult with the network administrator if the node name is not present.
- In the TCP/IP protocol block, the default IP address is “0.0.0.0.” It is acceptable to operate the printer with this default address. The error message “ARP DUPLICATE ADDRESS” might appear in this block. This is also an acceptable error code if the TCP/IP protocol is not being used. Check with the network administrator to determine the correct IP address for the printer.

Reference diagrams

This drawing shows key components, sensors, and switches that control the operation of the printer.

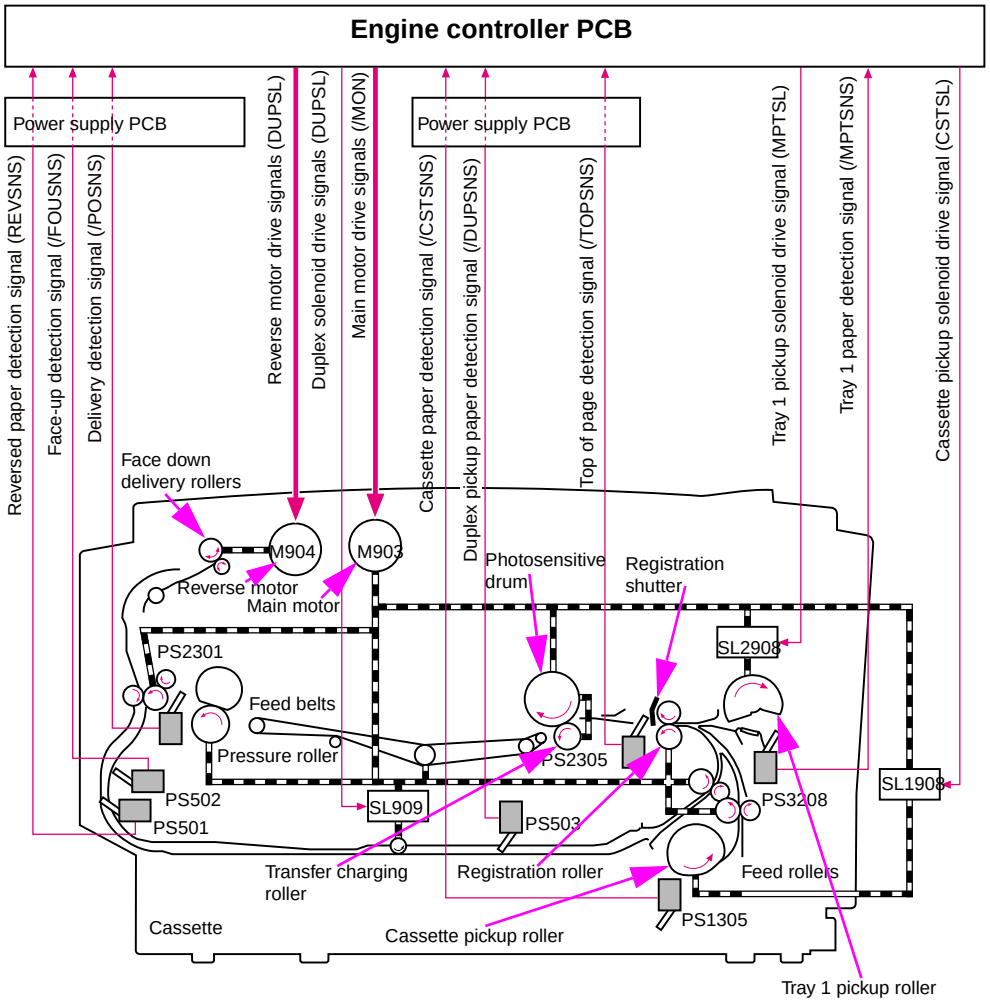


Figure 165. **Printer paper path, sensors, and signals**

PS501: Reversed paper sensor	PS502: Face-up sensor
PS503: Duplex pickup paper sensor	PS1305: Cassette paper sensor
PS2301: Delivery sensor	PS2305: Top-of-page sensor
PS3208: Tray 1 paper sensor	SL909: Duplex solenoid
SL1908: Cassette pickup solenoid	SL2908: Tray 1 pickup solenoid

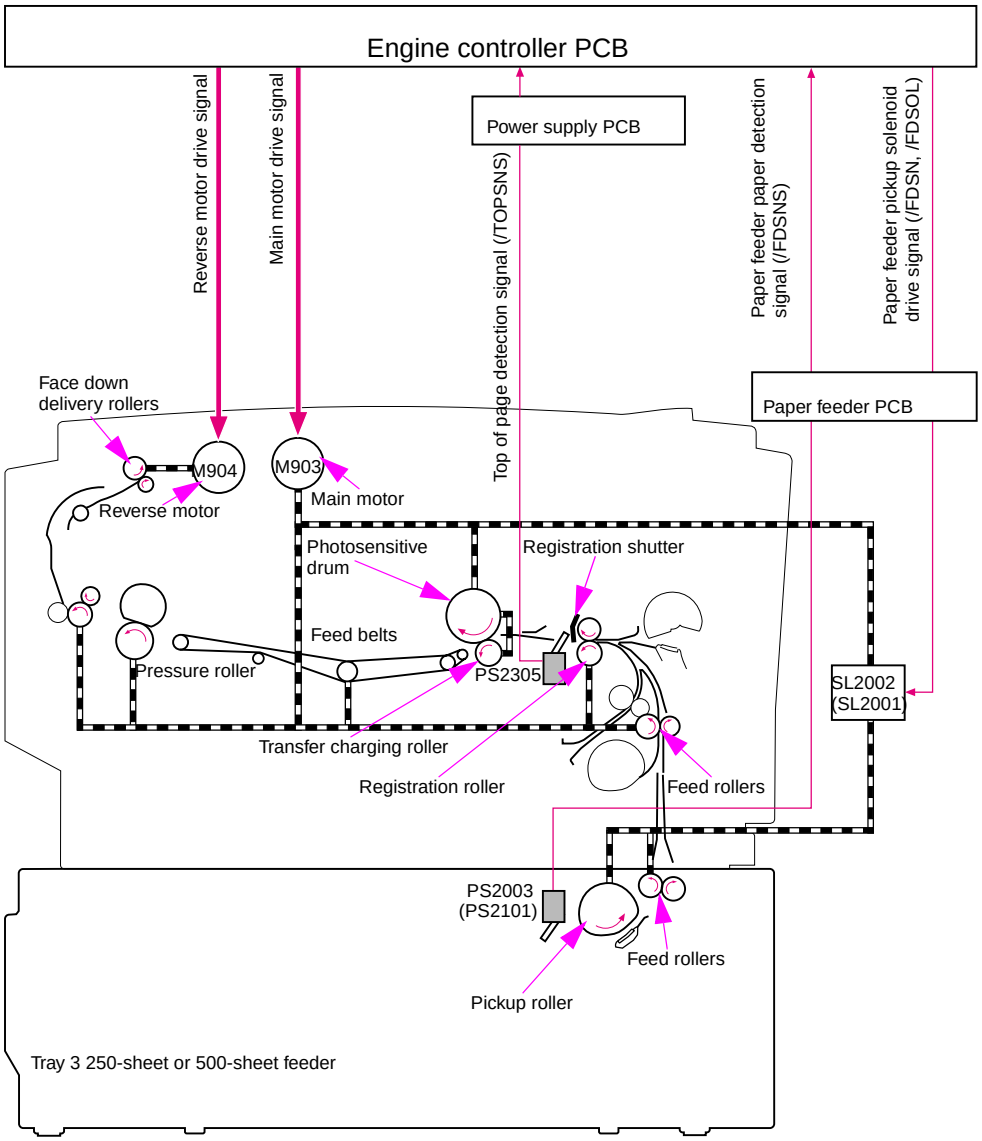


Figure 166. **Tray 3 paper path, sensors, and signal lever**

PS2305: Top-of-page sensor (printer)

PS2001: Paper feeder paper sensor (250-sheet)

PS2003: Paper feeder paper sensor (500-sheet)

SL2001: Paper feeder pickup solenoid (250-sheet)

SL2001: Paper feeder pickup solenoid (500-sheet)

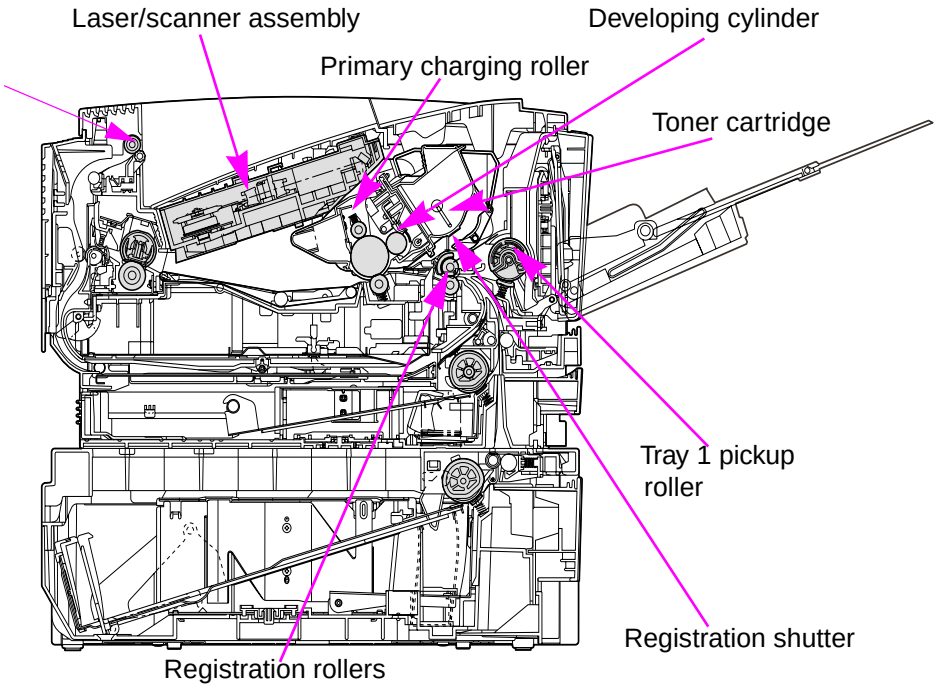


Figure 167. **General printer-component locations (1 of 2)**

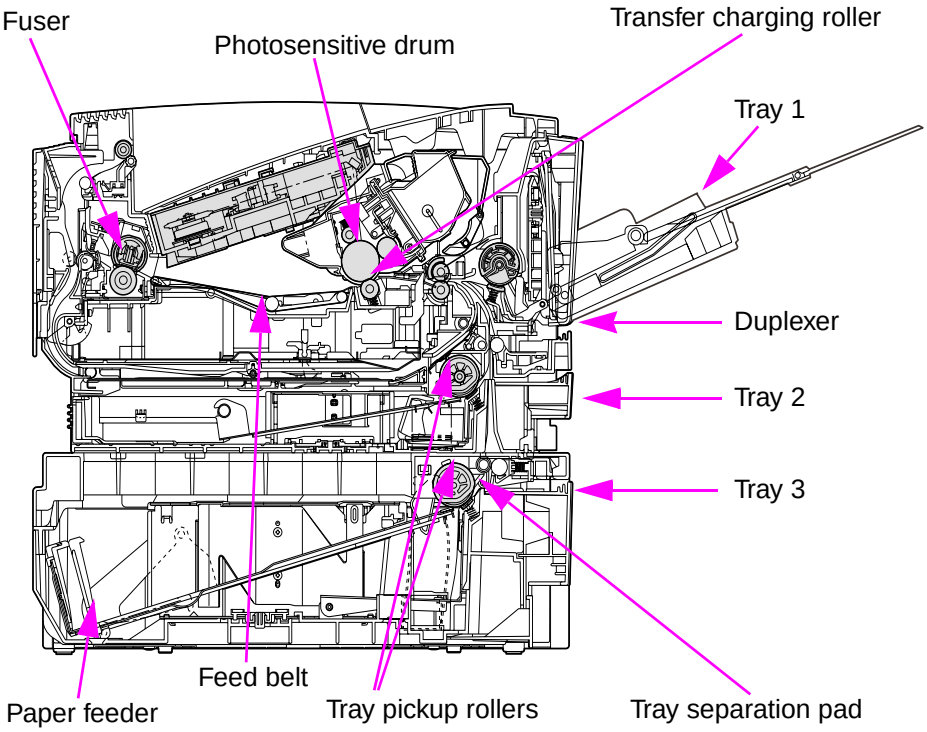


Figure 168. **General printer-component locations (2 of 2)**

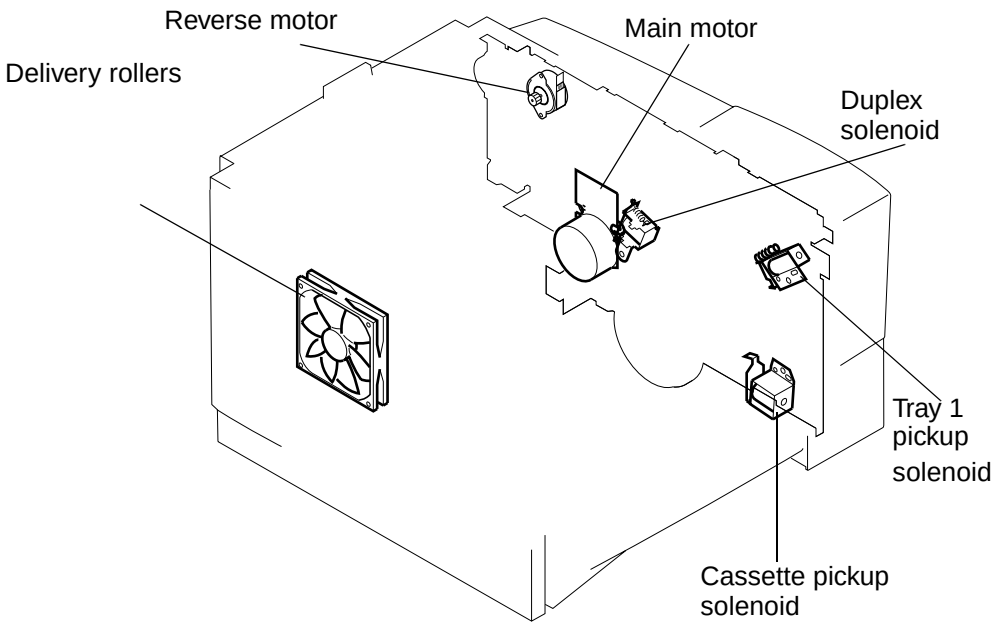


Figure 169. **Motor, fan, and solenoid locations**

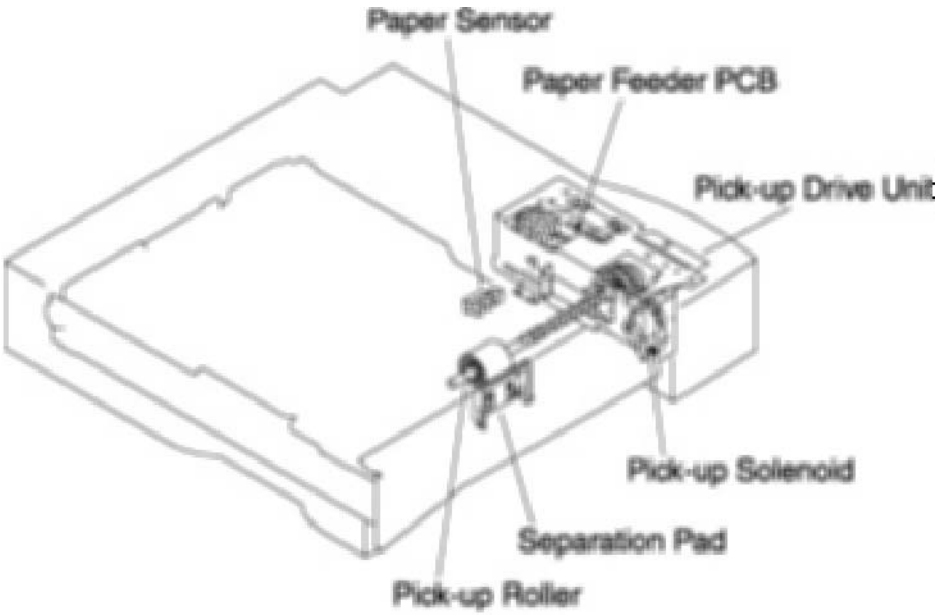


Figure 170. **250-sheet and 500-sheet tray 3 component locations**

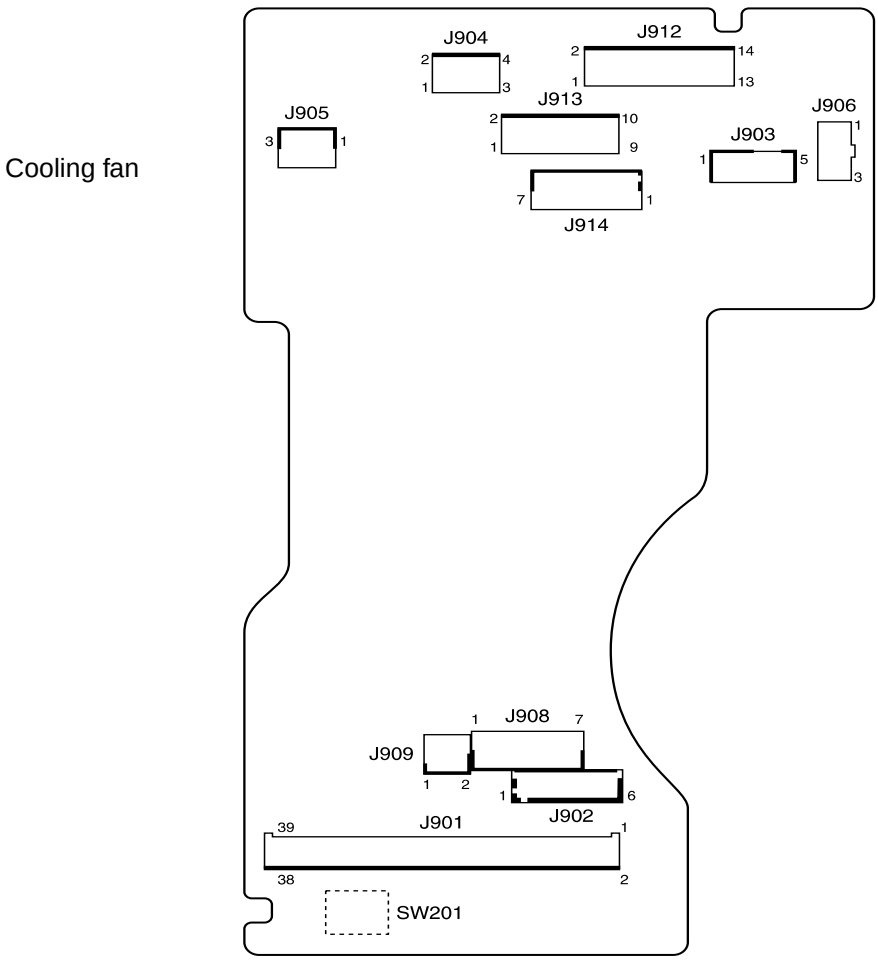


Figure 171. **Engine controller PCB**

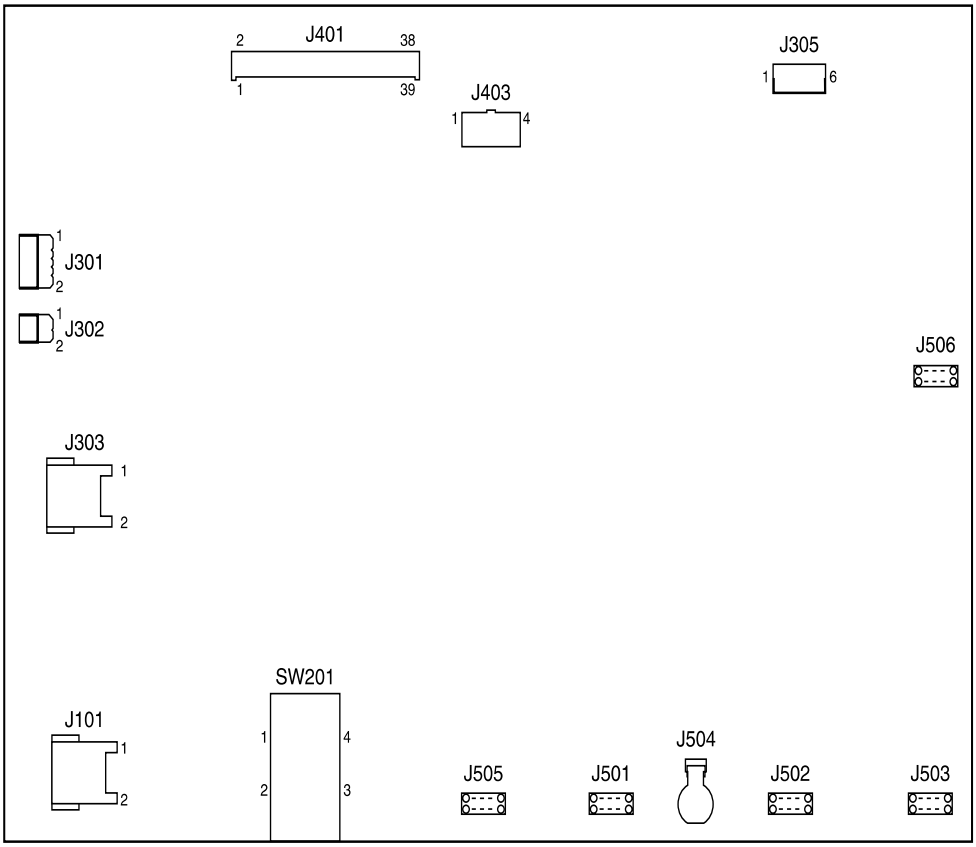


Figure 172. **Power supply PCB**

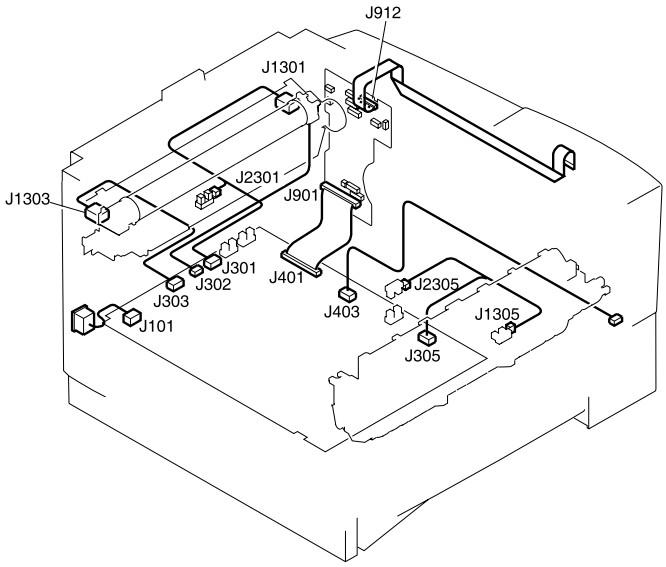


Figure 173. **Location of connectors (1 of 3)**

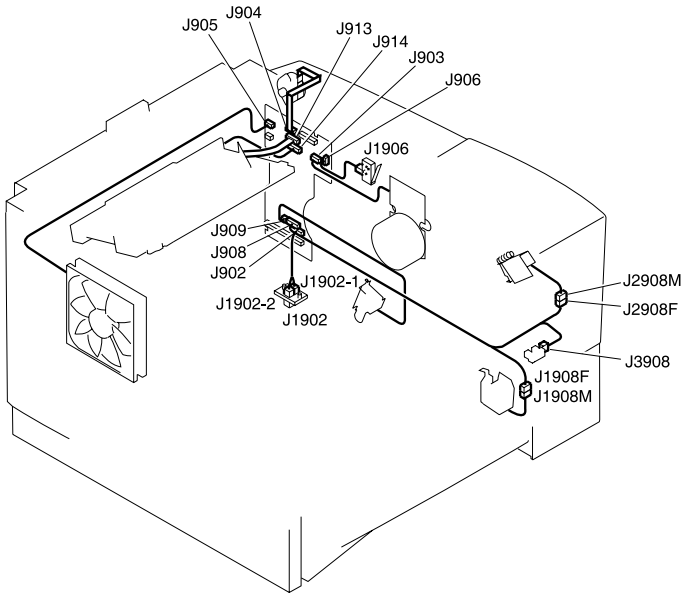


Figure 174. **Location of connectors (2 of 3)**

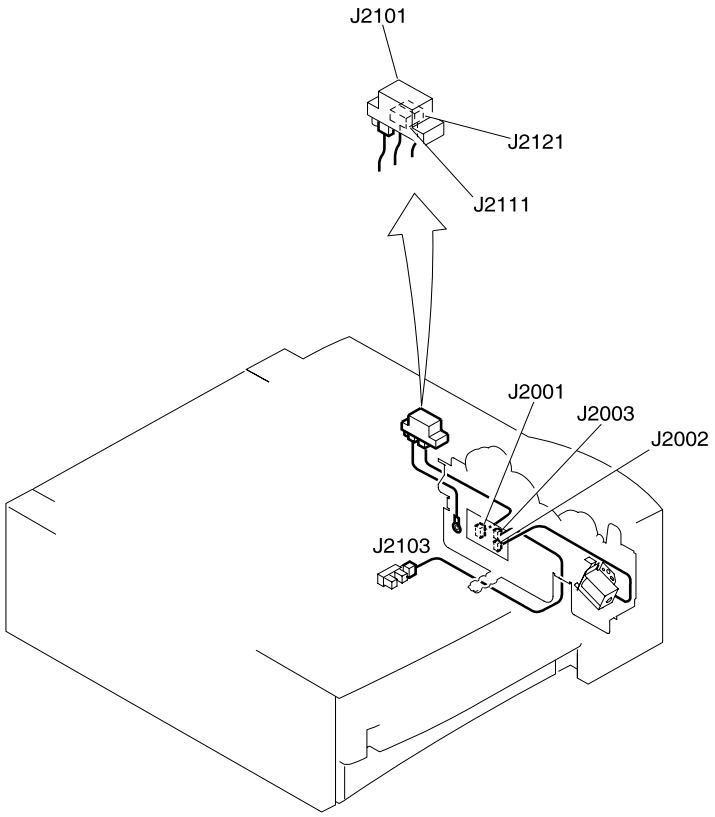


Figure 175. **Location of connectors (3 of 3)**

8 Parts and diagrams

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Introduction

The figures in this chapter illustrate the major subassemblies in the printer and their component parts. A table accompanies each exploded-view diagram. Each table lists the item number for the replaceable part, the associated part number for the item, the quantity, and a description of the part.

Note When looking for a part number, pay careful attention to the voltage listed in the description column to ensure that the part number selected is for the correct printer model.

Ordering parts

All standard part numbers listed are stocked and can be ordered from HP's Customer Services and Support Center.

Hewlett-Packard Company
Customer Services and Support Center
8050 Foothills Blvd.
Roseville, CA 95678
Parts Direct Ordering: (1) (800) 227-8164 (U.S. Only)

Hewlett-Packard Company
Customer Services and Support Center
Wolf-Hirth Strasse 33
D-7030
Boblingen, Germany
(49 7031) 14-2253

Ordering consumables

Consumables and accessories like those listed in table 41 can be ordered from Hewlett-Packard.

The phone numbers are:

- In the U.S.: (1) (800) 538-8787
- In Canada: (1) (800) 387-3154
- In Toronto: (1) (516) 671-8383
- In the United Kingdom: 0734-441212
- In Germany: 0130-3322

Contact your local HP Parts Coordinator for other phone numbers.

Note Parts that have no item number or part number listed are not field replacement parts (FRUs) and cannot be ordered. See "Reference materials" page 229 for documentation part numbers.

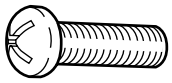
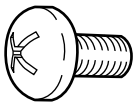
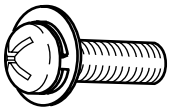
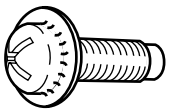
Consumables, accessories, and supplies

Table 41. Consumables, accessories, and supplies

Product number	Part number	Description
Consumable items		
C4096A		Ultra Precise toner cartridge
C4097A		Pallet quantity
Cables		
C2950A		2 m (5 ft) parallel cable (IEEE-1284)
C2951A		3 m (9 ft) parallel cable (IEEE-1284)
C6518A CPC		USB
168-pin memory (DIMMS)		
C7842AX		8 MB
C7843AX		16 MB
C7845AX		32 MB
Network connectivity		
J3110A		HP JetDirect 600N Ethernet (10 Base-T [RJ-45])
J3111A		HP JetDirect 600N Ethernet (10 Base-T [RJ-45], 10 Base-2 [BNC])
J4169A	J4169-69001	HP JetDirect 610N Fast Ethernet (10/100 Base-TX [RJ-45])
J4135A		USB
Media handling		
	RG5-4137-000CN	Tray 2 or 250-sheet feeder replacement
	R75-5001-000CN	250-sheet feeder and tray assembly
	R75-5009-000CN	500-sheet feeder and tray assembly
Reference materials		
	5963-7863	HP LaserJet Printer Family Print Media Guide
	5961-0976	HP PCL/PJL Reference Set
	5969-6818	HP JetDirect Print Server Administrator’s Guide
	5969-3412	HP JetDirect Print Server JetAdmin Setup Guide
	C7058-90915	HP Laserjet 2200 Series Printers User Guide (English version)
	C7058-00901	HP LaserJet 2200 Series Printers Getting Started Guide (English version)
	C7058-60106	HP LaserJet 2200 Series Printers Users CD-ROM (English and European)
	C7058-60107	HP LaserJet 2200 Series Printers Users CD-ROM (Asia Pacific)
	C7058-60108	HP LaserJet 2200 Series Printers Users CD-ROM (European)

Common fasteners and torque values

Table 42. Common fasteners

Example	Description	Sizes	Uses
	Screw	M3 by 6 mm M4 by 8 mm	To hold plastic to plastic
	Screw, tapping	M3 by 4 mm M3 by 6 mm M4 by 6 mm M4 by 12 mm	To hold plastic to metal (excluding the control panel)
	Screw, pan head	M4 by 10 mm	To hold plastic to plastic
	Screw, w/washer	M3 by 6 mm M3 by 8 mm M3 by 7 mm M4 by 6 mm M4 by 12 mm	To hold plastic to metal (excluding the covers)
	Screw, truss head	M3 by 6 mm M3 by 8 mm M4 by 8 mm M4 by 20 mm	To hold sheet metal to metal (excluding the formatter)
	E-ring		To hold gears in place

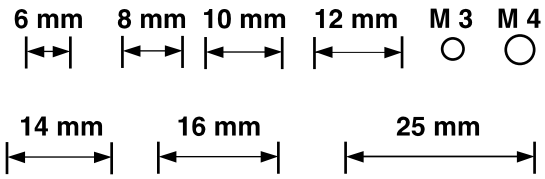


Table 43. Common torque values

Material	Canon-recommended torque value	Conversion	HP-recommended torque value
Plastic to metal	8 kg-cm	6.94 lb-in	5.5 lb-in
Metal to metal	10 kg-cm	8.68 lb-in	10 lb-in
PCBA	8 kg-cm	6.94 lb-in	5.5 lb-in
Plastic to plastic	8 kg-cm	6.94 lb-in	5.5 lb-in

Illustrations and parts lists

The following illustrations and parts tables list the field replaceable units (FRU) for this printer. Two tables at the end of this chapter list all of the parts shown in this chapter: table 66 lists the parts in alphabetical order, and table 67 lists the parts in numerical order by part number. Both tables list the appropriate figure in this chapter that shows the part.

External covers and panels

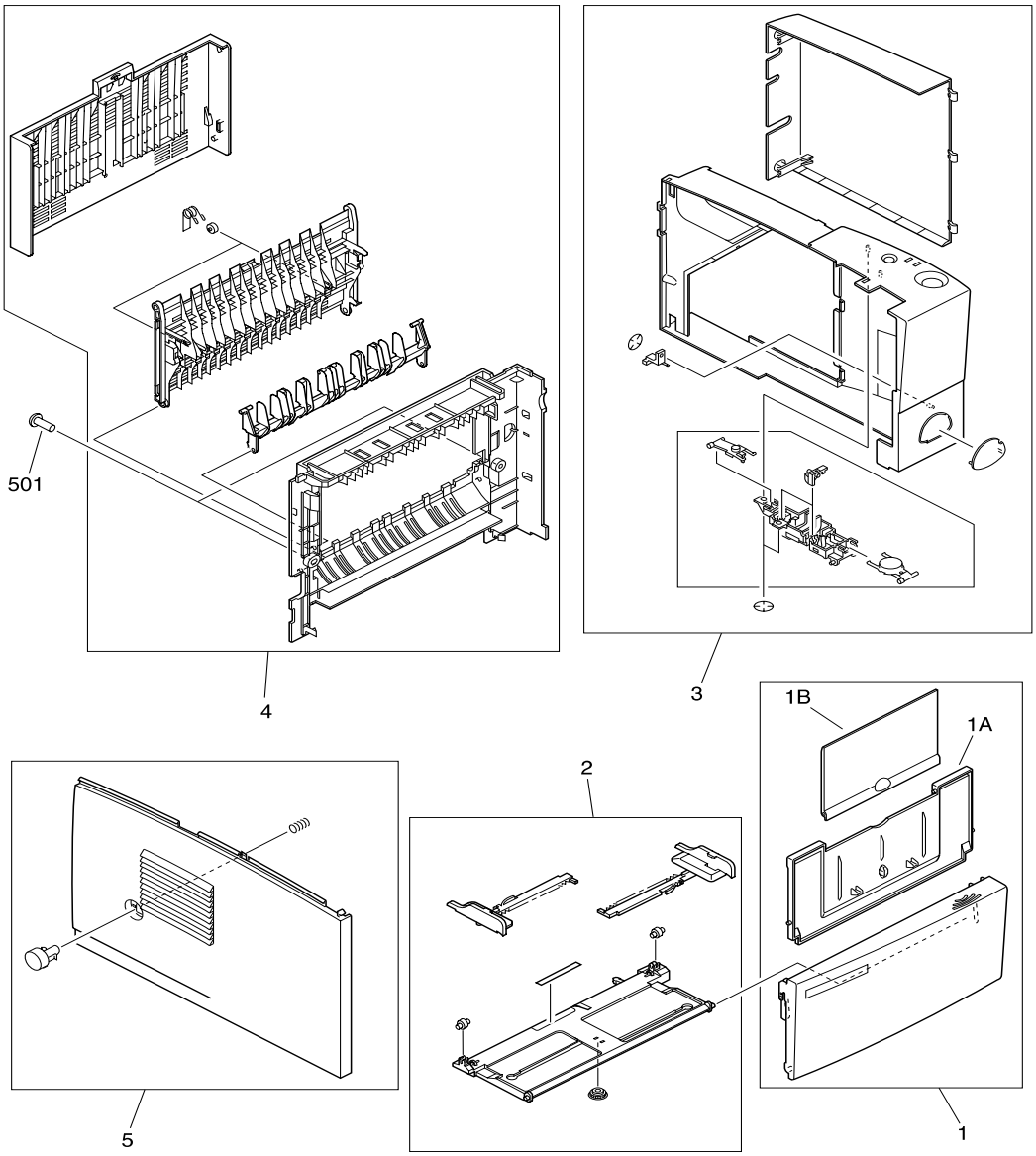


Figure 176. **Printer external covers and panels**

Table 44. Printer external covers and panels

Ref	Description	Part number	Qty
1	Cover assembly, tray 1	RG5-4121-000CN	1
1A	Expansion, tray 1	RB2-3036-000CN	1
1B	Expansion, tray 1	RB2-3037-000CN	1
2	Tray assembly (tray 1)	RG5-5576-000CN	1
3	DIMM cover assembly	RG5-5545-000CN	1
4	Rear cover assembly	RG5-5546-000CN	1
5	Left cover assembly	RG5-5549-000CN	1
501	Screw, TP, Pan Head, m4 by 10	XB4-7401-007CN	2

Top cover assembly

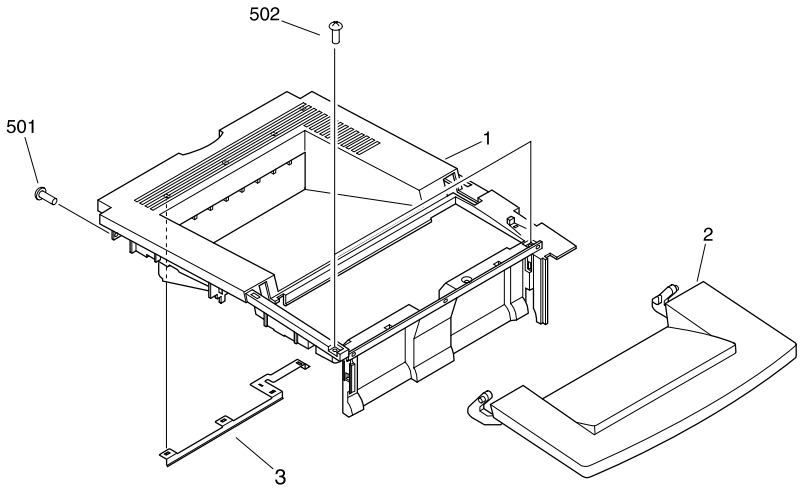


Figure 177. **Top cover assembly**

Table 45. Top cover assembly

Ref	Description	Part number	Qty
1	Top cover	RB2-6280-000CN	1
2	Cover, cartridge	RB2-2856-000CN	1
3	Static charge eliminator	RB2-6281-000CN	1
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	2
502	Screw, TP, Truss Head, M4 by 20	XB4-7402-007CN	2

Internal components

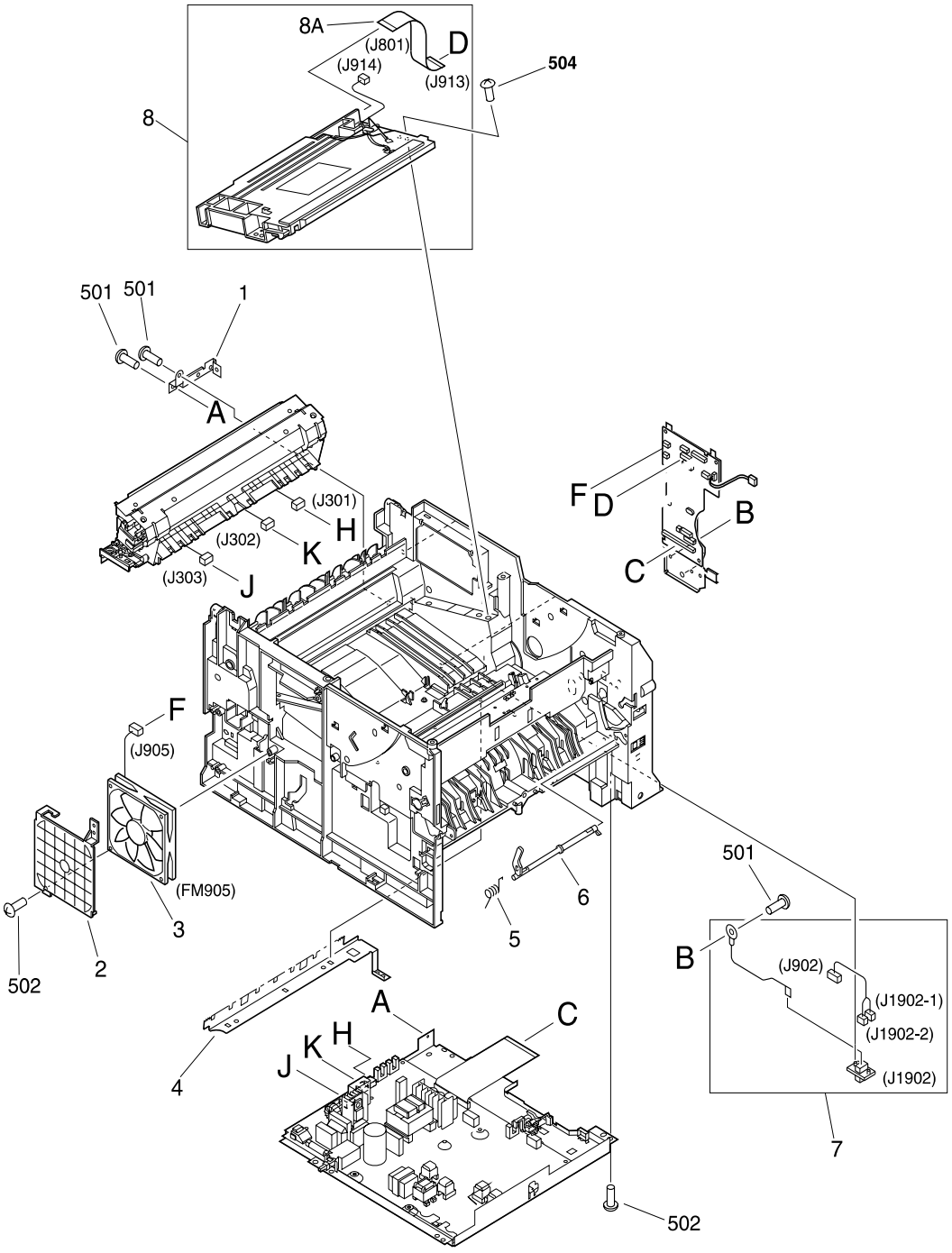


Figure 178. **Internal components (1 of 5)**

Table 46. Internal components (1 of 5)

Ref	Description	Part number	Qty
1	Plate, grounding	RB2-6246-000CN	1
2	Mount, fan	RB2-6255-000CN	1
3	Fan	RH7-1463-000CN	1
4	Eliminator, static charge	RB2-6261-000CN	1
5	Spring, torsion	RB2-2837-000CN	1
6	Lever, sensor	RB2-2836-000CN	1
7	Paper-feed cable	RG5-5598-000CN	1
8	Laser/scanner assembly	RG5-5591-000CN	1
8A	Flat cable, laser	RH2-5427-000CN	1
501	Screw, w/washer, M3 by 6	XB2-7300-607CN	3
502	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	5
503	Screw, M3 by 4	XB6-7300-407CN	2
504	Screw, TP, M4 by 12	XA9-1273-000CN	4

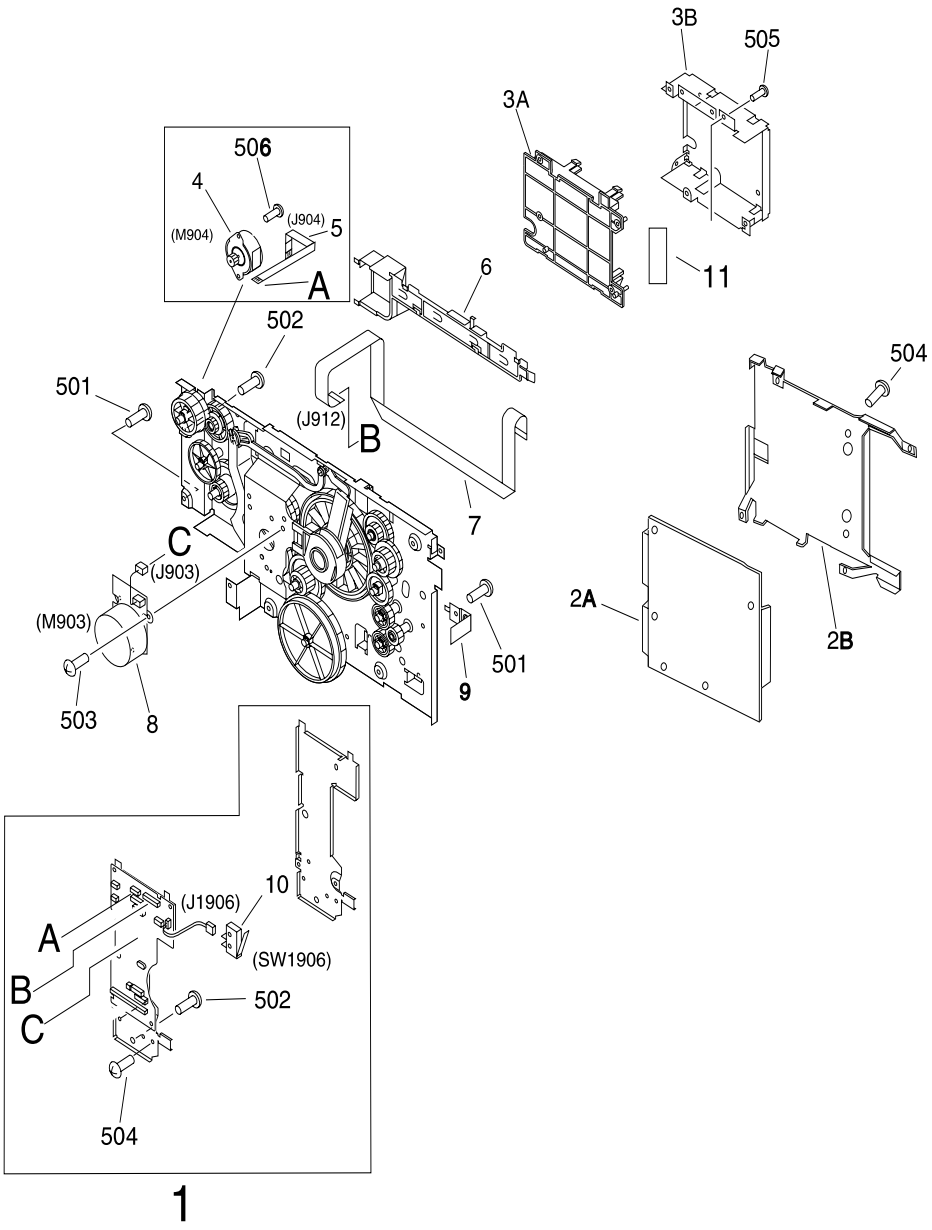


Figure 179. **Internal components (2 of 5)**

Table 47. Internal components (2 of 5)

Ref	Description	Part number	Qty
1	Engine control assembly	RG5-5566-000CN	1
2A	Formatter PCB	C4209-60001	1
2B	Formatter RFI shield	C7058-00001	
3A	Guide, EIO	RB2-2944-000CN	1
3B	Plate, mount, EIO	RB2-2945-000CN	1
4	Reverse motor, 23 V dc	RH7-1461-000CN	1
5	Flat cable, reverse motor	RH2-5425-000cn	1
6	Guide, flat cable	RB2-6247-000CN	1
7	Flat cable, I/F	RH2-5423-000CN	1
8	Motor, dc	RH7-1458-000CN	1
9	Plate, protection	RB2-6252-000CN	1
10	Microswitch	RH7-6051-000CN	1
11	RFI clip	C7058-00010	1
501	Screw, w/washer, M3 by 6	XB2-7300-607CN	2
502	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	6
503	Screw, M3 by 4	XB6-7300-407CN	4
504	Screw, TP, M3 by 6	XA9-1223-000CN	6

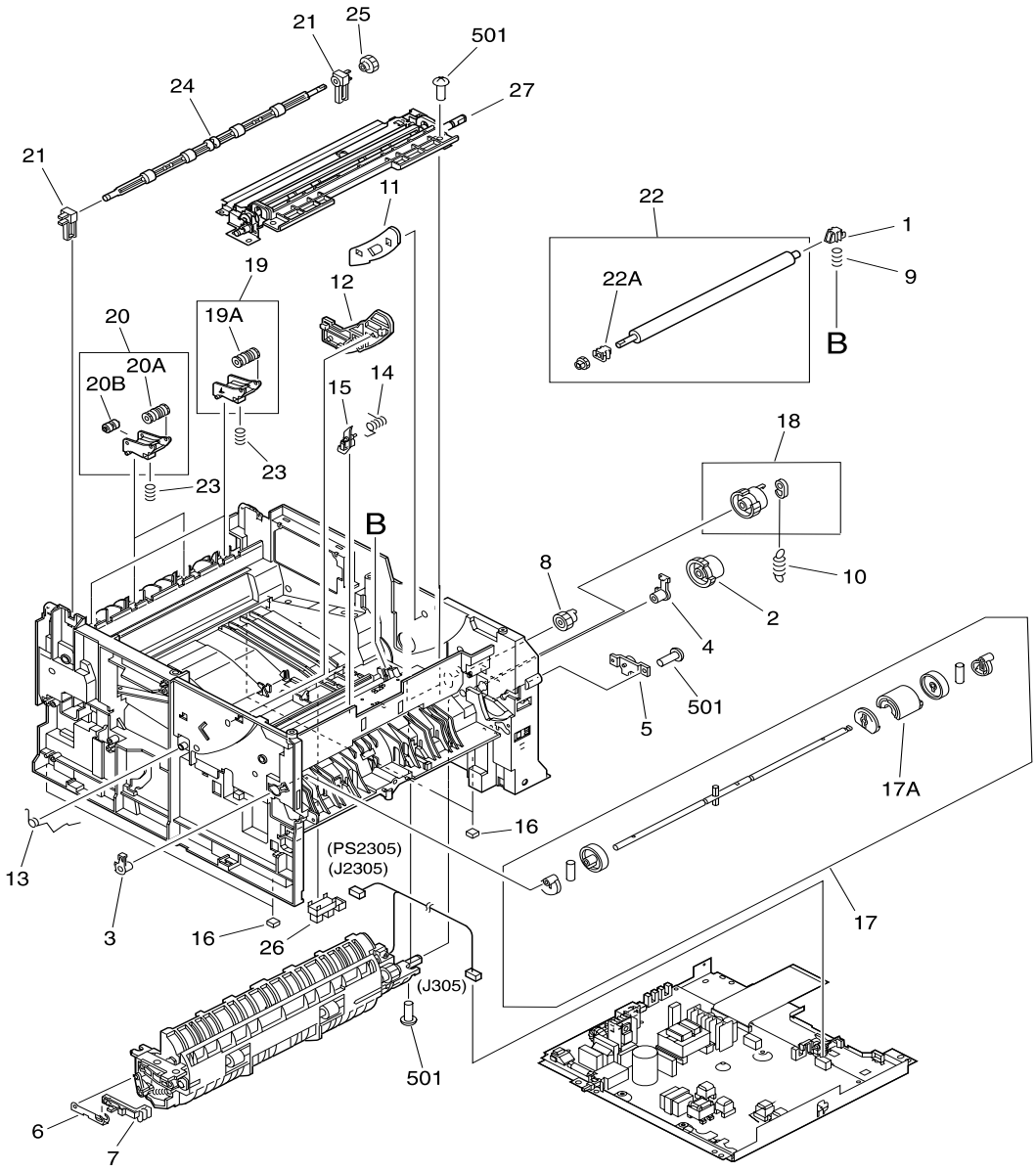


Figure 180. **Internal components (3 of 5)**

Table 48. Internal components (3 of 5)

Ref	Description	Part number	Qty
1	Bushing, transfer, right	RB2-2926-020CN	1
2	Gear, 26T	RB2-3040-000CN	1
3	Bushing, left	RB2-3043-000CN	1
4	Bushing, right	RB2-3044-000CN	1
5	Damper	RB2-6248-000CN	1
6	Rod, jam clearing	RB2-6250-000CN	1
7	Lever, jam clearing	RB2-6251-000CN	1
8	Gear, 14T	RS6-0445-000CN	1
9	Spring, compression	RS6-2022-000CN	1
10	Spring, tension	RS6-2025-000CN	1
11	Guide, cartridge, right	RB2-2830-020CN	1
12	Guide, cartridge, left	RB2-2831-020CN	1
13	Spring, compression	RB2-2832-000CN	1
14	Spring, torsion	RB2-2843-000CN	1
15	Arm, sensor	RB2-6264-000CN	1
16	Foot, rubber	RB2-6297-000CN	4
17	Tray 1 pick-up assembly	RG5-4128-000CN	1
17A	Roller, pick-up	RB2-2900-000CN	1
18	Cassette pick-up gear assembly	RG5-4156-000CN	1
19	FD delivery roller assembly	RG5-5541-000CN	2
19A	Roller, face-down, lower 1	RB2-2849-000CN	1
20	FD delivery roller assembly	RG5-5542-000CN	2
20A	Roller, face-down, lower 1	RB2-2849-000CN	1
20B	Roller, face-down, lower 2	RB2-6277-000CN	1
21	Bushing	RB2-2850-000CN	2
22	Transfer roller assembly	RG5-5581-000CN	1
23	Spring, compression	RS6-2375-000CN	4
24	Roller, face-down, upper	RF5-3275-000CN	1
25	Gear, 15T	RS6-0441-000CN	1
26	Photo interrupter TLP1242	WG8-5382-000CN	1
27	Registration assembly	RG5-5556-000CN	1
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	12

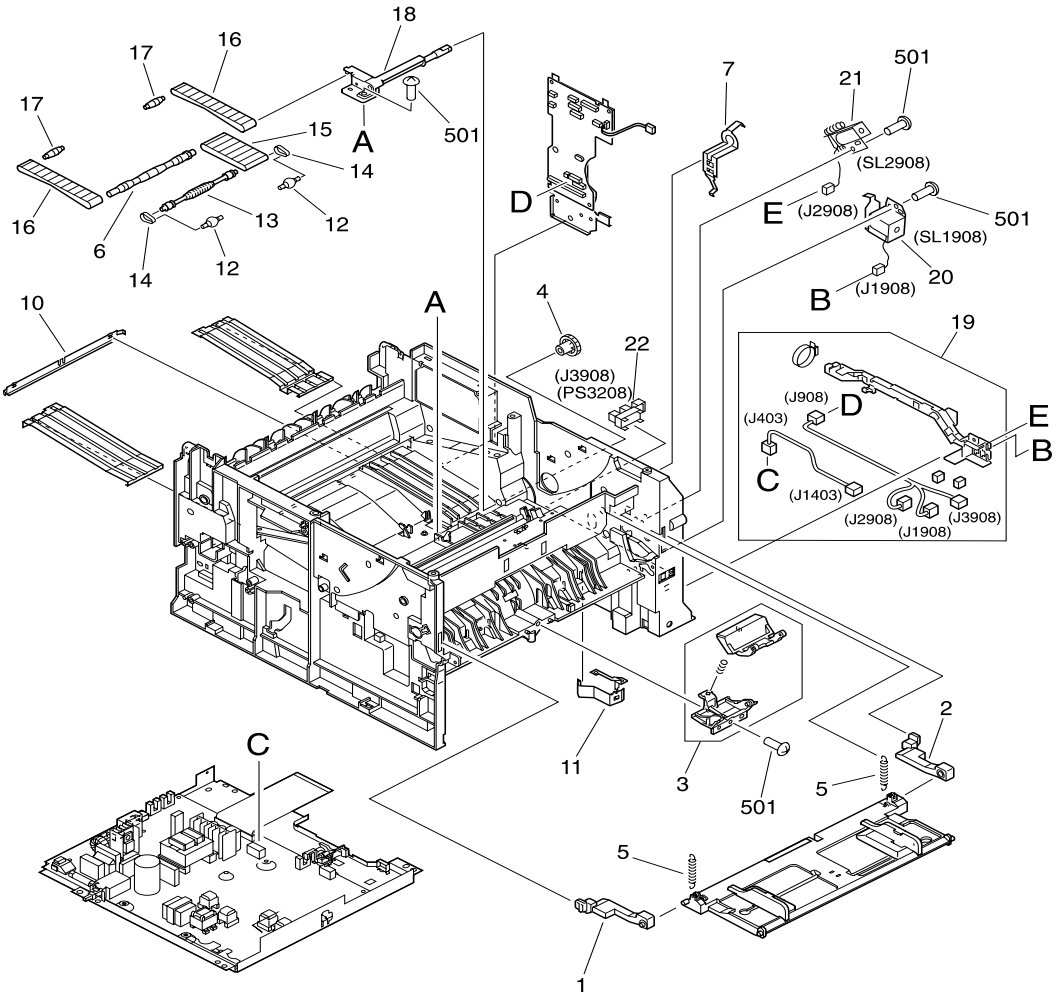


Figure 181. **Internal components (4 of 5)**

Table 49. Internal components (4 of 5)

Ref	Description	Part number	Qty
1	Hinge, left	RB2-3041-020CN	1
2	Hinge, right	RB2-3042-020CN	1
3	Pad, separation	RF5-3272-000CN	1
4	Gear, 20T	RS6-0464-000CN	1
5	Spring, tension	RS6-2030-000CN	2
6	Shaft, drive, 1	RB2-3073-000CN	1
7	Spring, leaf, grounding	RB2-3075-000CN	1
10	Plate, grounding	RB2-3080-000CN	1
11	Spring, leaf	RB2-6266-000CN	1
12	Pulley	RB2-6268-000CN	2
13	Shaft, drive, front	RB2-6269-000CN	1
14	Belt, paper feed, 3	RB2-6270-000CN	2
15	Belt, paper feed, 1	RB2-6272-000CN	1
16	Belt, paper feed, 2	RB2-6273-000CN	2
17	Shaft, drive, rear	RB2-6274-000CN	2
18	Gear assembly	RG5-5577-000CN	1
19	Cable guide assembly	RG5-5568-000CN	1
20	Solenoid	RH7-5270-000CN	1
21	Solenoid	RH7-5273-000CN	1
22	Photo interrupter TLP1242	WG8-5382-000CN	1
501	Screw, TP, pan head M4 by 10	XB4-7401-007CN	4

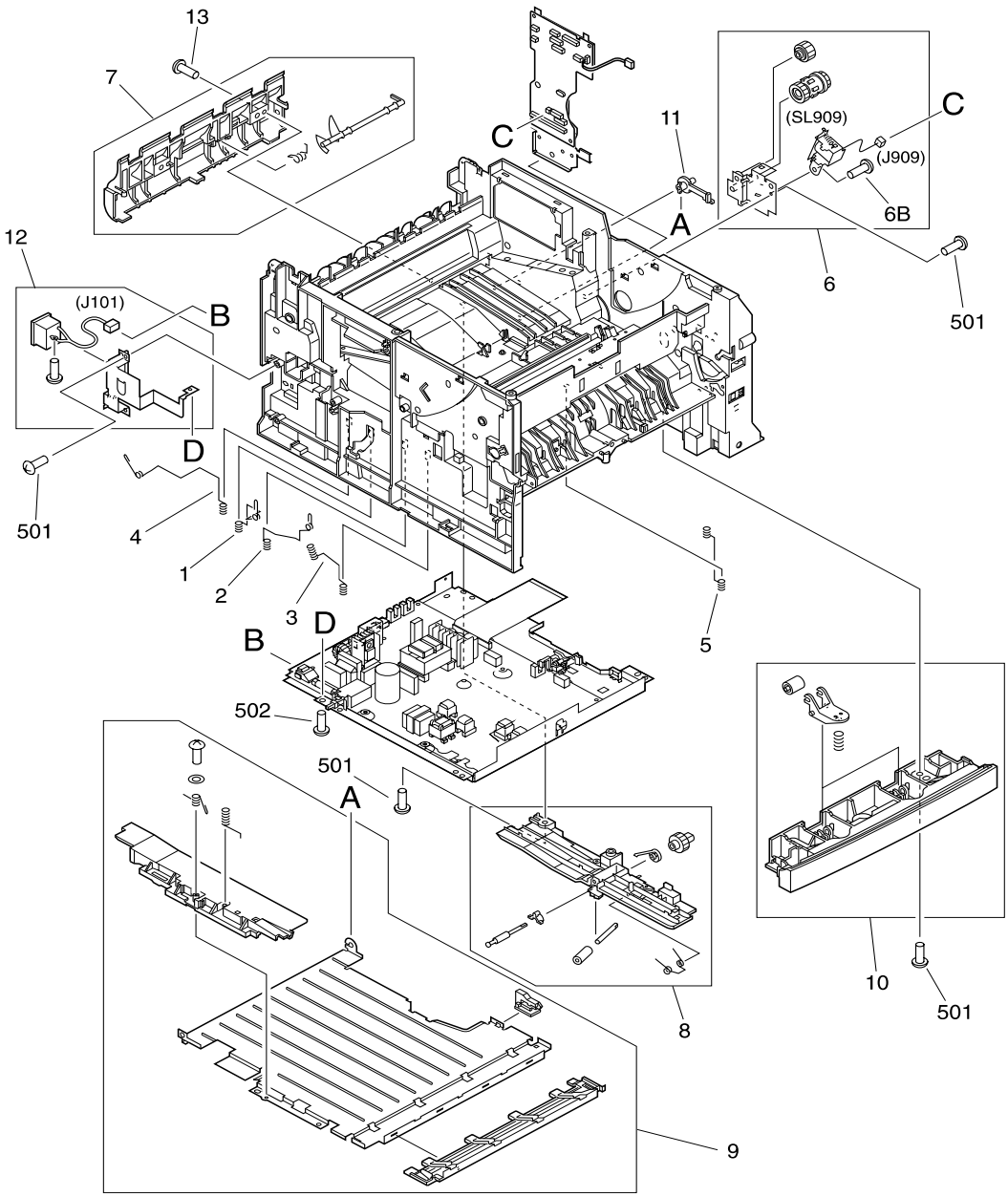


Figure 182. **Internal components (5 of 5)**

Table 50. Internal components (5 of 5)

Ref	Description	Part number	Qty
1	Spring, compression	RB2-6262-000CN	1
2	Spring, compression	RB2-6263-000CN	1
3	Spring, compression	RB2-6265-000CN	1
4	Spring, compression	RB2-6267-000CN	1
5	Spring, compression	RB2-6271-000CN	1
6	Duplex solenoid assembly	RG5-5552-000CN	1
6B	Screw, RS, M3 by 6	XA9-0686-000CN	1
7	Reverse guide assembly	RG5-5548-000CN	1
8	Position guide assembly	RG5-5553-000CN	1
9	Duplex feed guide assembly	RG5-5554-000CN	1
10	Feed roller assembly	RG5-5555-000CN	1
11	Hinge, feed guide	RB2-6249-000CN	1
12	Inlet cable unit	RG5-5565-000CN	1
13	Screw, w/washer, M4 by 12	XA9-1206-000CN	2
501	Screw, TP, Pan Head, M4 by 10	XB4-7401-007CN	5
502	Screw, w/washer, M3 by 6	XB2-7300-607CN	1

Power supply assembly

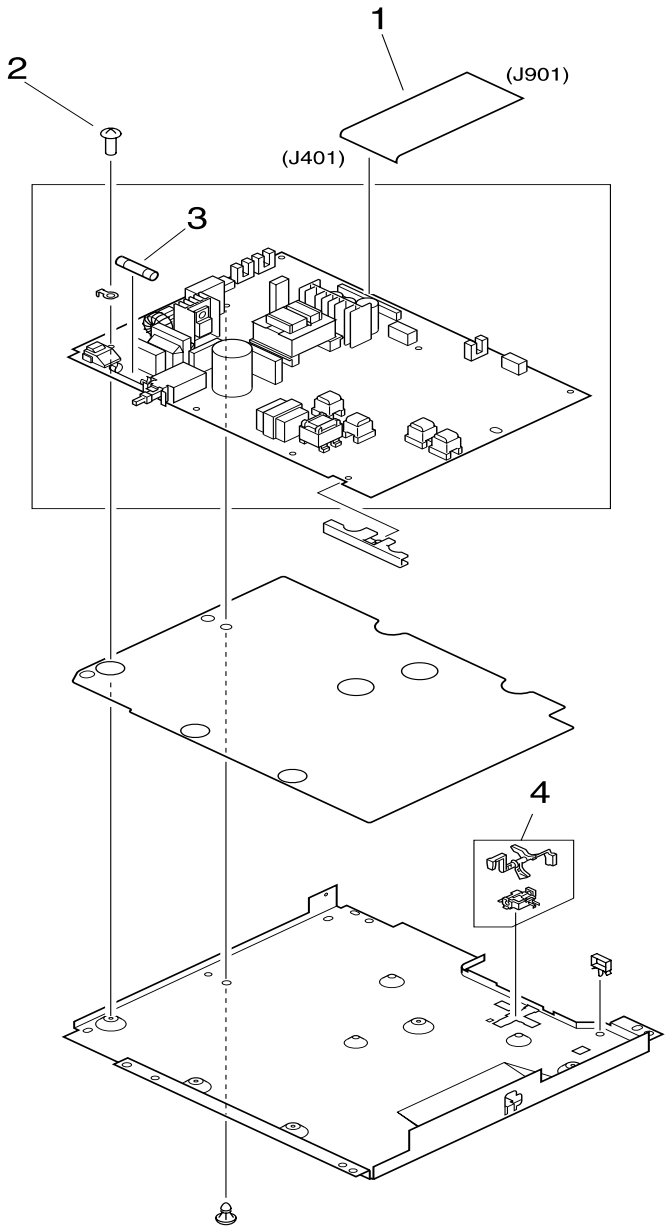


Figure 183. **Power supply assembly**

Table 51. Power supply assembly

Ref	Description	Part number	Qty
	Power supply assembly, 100 to127 V	RG5-5563-000CN	1
	Power supply assembly, 220 to240 V	RG5-5573-000CN	1
1	Cable, flat	RH2-5421-000CN	1
2	Screw, w/washer, M3 by 8	XA9-1226-000CN	5
3	Fuse, 250 V, 15 A, 100 to127 V	WD1-0268-000CN	1
3	Fuse, 250 V, 8 A, 220 to240 V	RH3-8006-000CN	1
4	Holder, sensor lever	RF5-3279-000CN	1

Printer drive assembly

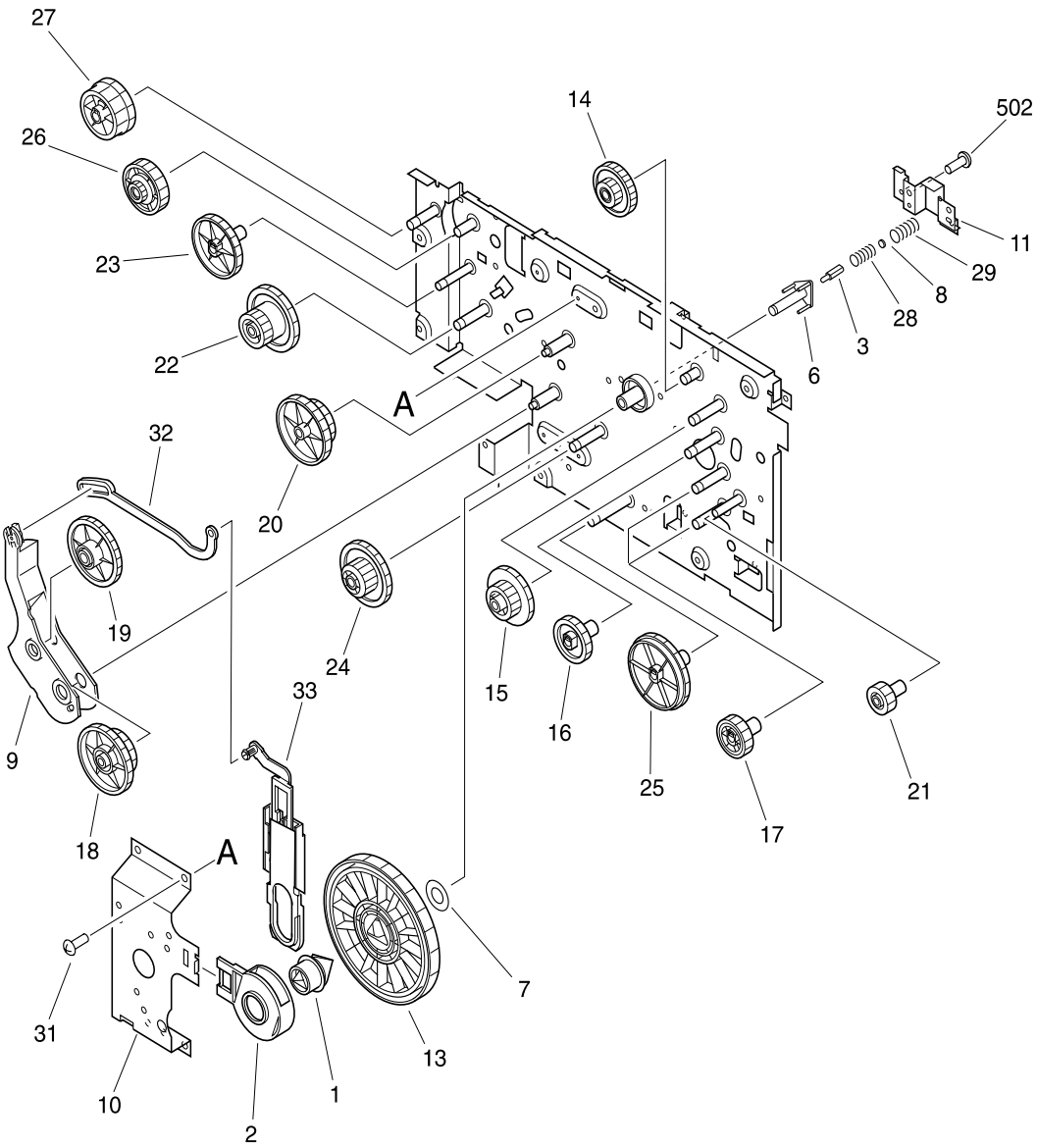


Figure 184. **Printer drive assembly**

Table 52. Printer drive assembly

Ref	Description	Part number	Qty
	Printer drive assembly	RG5-5562-000CN	1
1	Shaft, coupling	RB2-2935-000CN	1
2	Bushing	RB2-2936-000CN	1
3	Pin	RB2-2943-000CN	1
6	Holder, pin	RB2-2947-000CN	1
7	Washer	RB2-2949-000CN	1
8	Flange, spring	RB2-2950-000CN	1
9	Arm, drive	RB2-6376-000CN	1
10	Plate, motor	RB2-6377-000CN	1
11	Plate, spring	RB2-6378-000CN	1
13	Gear, 201T	RS6-0446-000CN	1
14	Gear, 17T/68T	RS6-0448-000CN	1
15	Gear, 25T/41T	RS6-0449-000CN	1
16	Gear, 31T	RS6-0450-000CN	1
17	Gear, 26T	RS6-0451-000CN	2
18	Gear, 91T/28T	RS6-0910-000CN	1
19	Gear, 42T	RS6-0911-000CN	1
20	Gear, 93T/73T	RS6-0912-000CN	1
21	Gear, 17T	RS6-0913-000CN	1
22	Gear, 46T/22T	RS6-0914-000CN	1
23	Gear, 39T	RS6-0915-000CN	1
24	Gear, 28T/88T	RS6-0916-000CN	1
25	Gear, 75T	RS6-0917-000CN	1
26	Gear, 75T/28T	RS6-0918-000CN	1
27	Gear, 79T/36T	RS6-0919-000CN	1
28	Spring, compression	RS6-2031-000CN	1
29	Spring, compression	RS6-2379-000CN	1
30	Screw, M3 by 6	XA9-0904-000CN	4
31	Screw, TP, M3 by 6	XA9-1223-000CN	4
32	Lever, drive release	RB9-0641-000CN	1
33	Coupling assembly	RG9-1473-000CN	1
501	Screw, machine, truss head, M3 by 6	XB1-2300-605CN	2
502	Screw, with star washer, M3 by 7	XB2-7300-407CN	2

Cassette pickup assembly

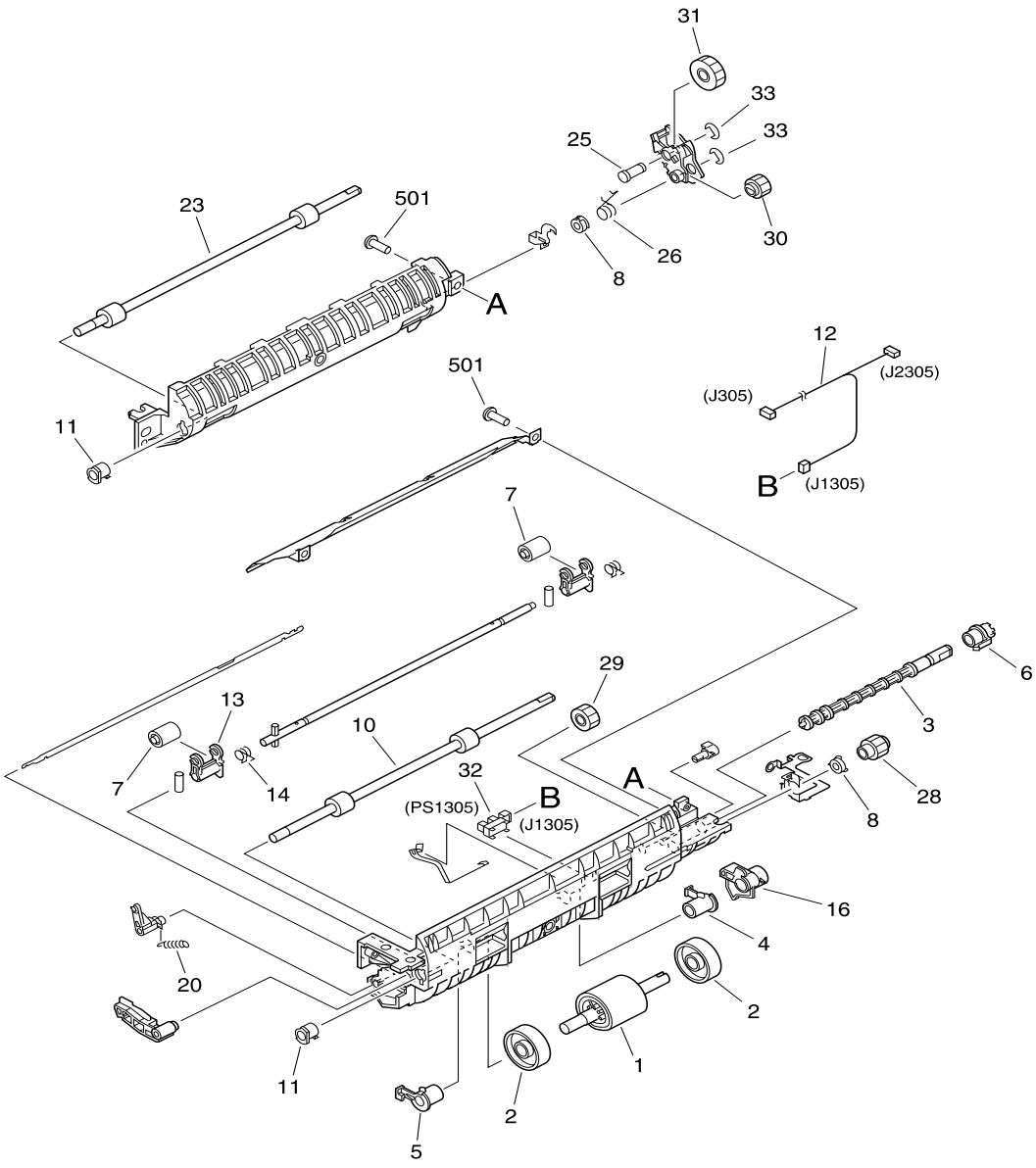


Figure 185. **Cassette pickup assembly**

Table 53. Cassette pickup assembly

Ref	Description	Part number	Qty
	Cassette pick-up assembly	RG5-5551-000CN	1
1	Roller, paper pick-up	RB2-6304-000CN	1
2	Roller	RB2-2892-000CN	2
3	Shaft, drive	RB9-0681-000CN	1
4	Bushing, right	RB2-2895-000CN	1
5	Bushing, left	RB2-2896-000CN	1
6	Bushing	RB2-2897-020CN	1
7	Roller	RB2-3046-000CN	2
8	Bushing	RB2-3081-000CN	2
10	Roller, feed	RB2-6302-000CN	1
11	Bushing	RB2-6303-000CN	2
12	Sensor cable	RG5-5583-000CN	1
16	Arm, paper sensor	RB2-6310-000CN	1
20	Spring, tension	RB2-6314-000CN	1
23	Roller, feed	RB2-6318-000CN	1
25	Shaft, gear	RB2-6320-000CN	1
26	Spring, torsion	RB2-6321-000CN	1
28	Gear, 15T	RS6-0904-000CN	1
29	Gear, 16T	RS6-0905-000CN	1
30	Gear, 15T	RS6-0906-000CN	1
31	Gear, 24T	RS6-0907-000CN	1
32	Photo-interrupter, GP1SQ73P	WG8-5364-000CN	1
33	E-ring	XD9-0135-000CN	2
501	Screw, TP, truss head, M4 by 8	XB4-7400-809CN	5

Fusing assembly

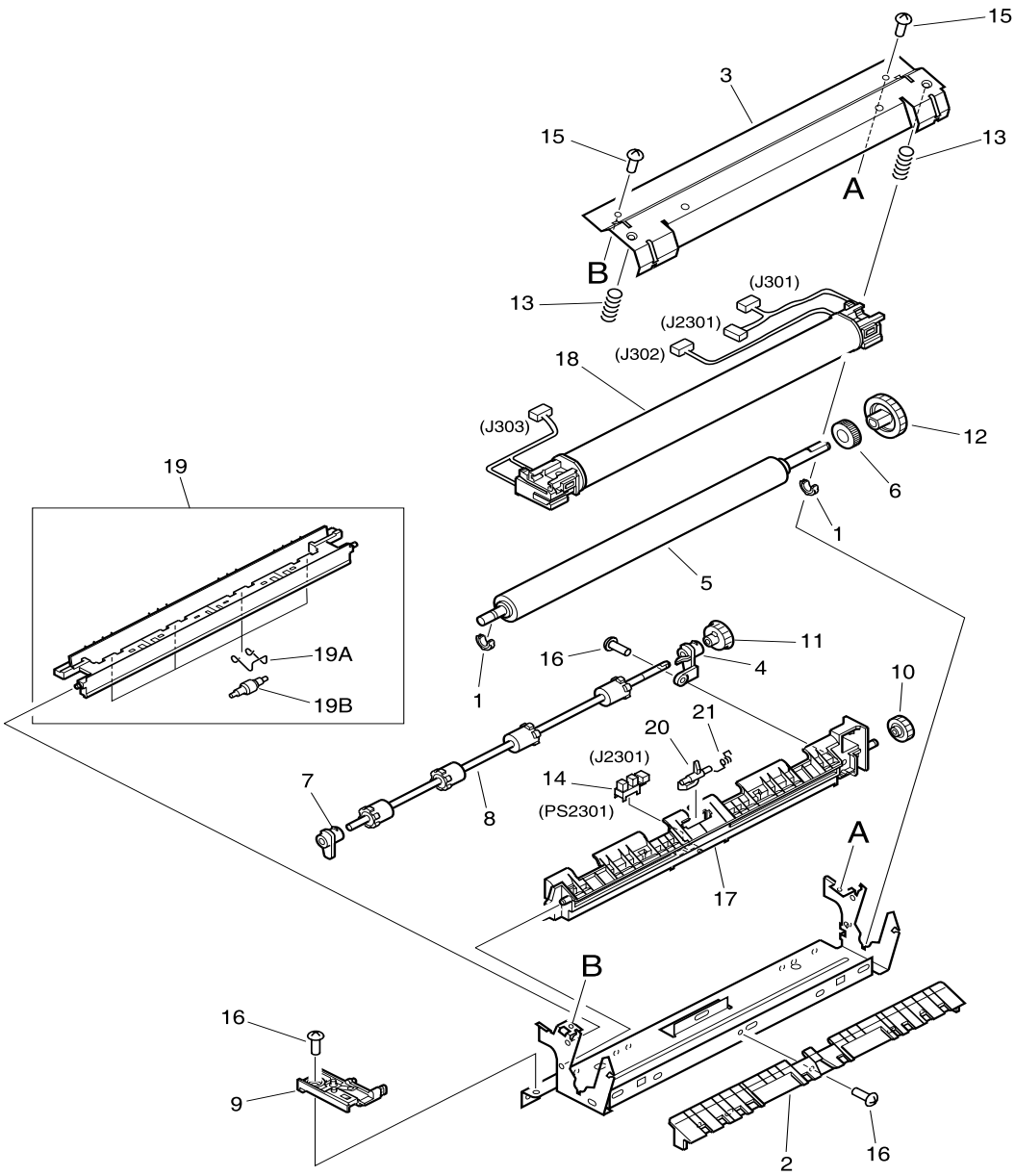


Figure 186. **Fusing assembly**

Table 54. Fusing assembly

Ref	Description	Part number	Qty
	Fusing assembly, 100-127 V	RG5-5559-000CN	1
	Fusing assembly, 220-240 V	RG5-5569-000CN	1
1	Bushing	RB2-2973-000CN	2
2	Guide, entrance	RB2-6357-000CN	1
3	Plate, pressure	RB2-6358-000CN	1
4	Bushing	RB2-6359-000CN	1
5	Roller, pressure	RB2-6368-000CN	1
6	Bushing	RB2-6370-000CN	1
7	Bushing	RB2-6371-000CN	1
8	Roller, delivery	RB2-6372-000CN	1
9	Holder, contact	RF5-2609-000CN	1
10	Gear, 14T	RS6-0921-000CN	1
11	Gear, 16T	RS6-0922-000CN	1
12	Gear, 27T	RS6-0923-000CN	1
13	Spring, compression	RS6-2378-000CN	2
14	Photo-interrupter, TLP1242	WG8-5382-000CN	1
15	Screw, TP, M3 by 6	XA9-1223-000CN	2
16	Screw, w/washer, M3 by 8	XA9-1226-000CN	3
17	Guide, delivery, lower	RB2-6350-000CN	1
18	Fuser film assembly, 100-127 V	RG5-5560-000CN	1
18	Fuser film assembly, 220-240 V	RG5-5570-000CN	1
19	Guide, delivery upper	RG5-5561-000CN	1
19A	Spring, compression	RB2-2978-000CN	4
19B	Roller, delivery	RB2-6374-000CN	4
20	Lever, delivery	RB2-6351-000CN	1
21	Spring, torsion	RB2-6352-000CN	1

PCB assembly location

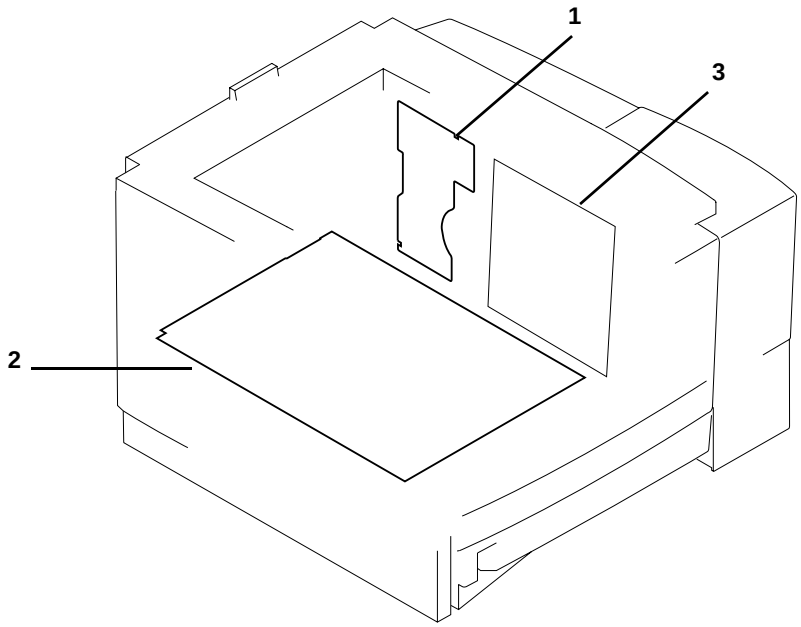


Figure 187. **PCB assembly location**

Table 55. PCB assembly location

Ref	Description	Part number	Qty
1	Engine controller assembly	RG5-5566-000CN	1
2	Power supply assembly, 100-127 V	RG5-5563-000CN	1
	Power supply assembly, 220-240 V	RG5-5573-000CN	1
3	Formatter assembly	C4209-60001	1

250-sheet feeder external covers

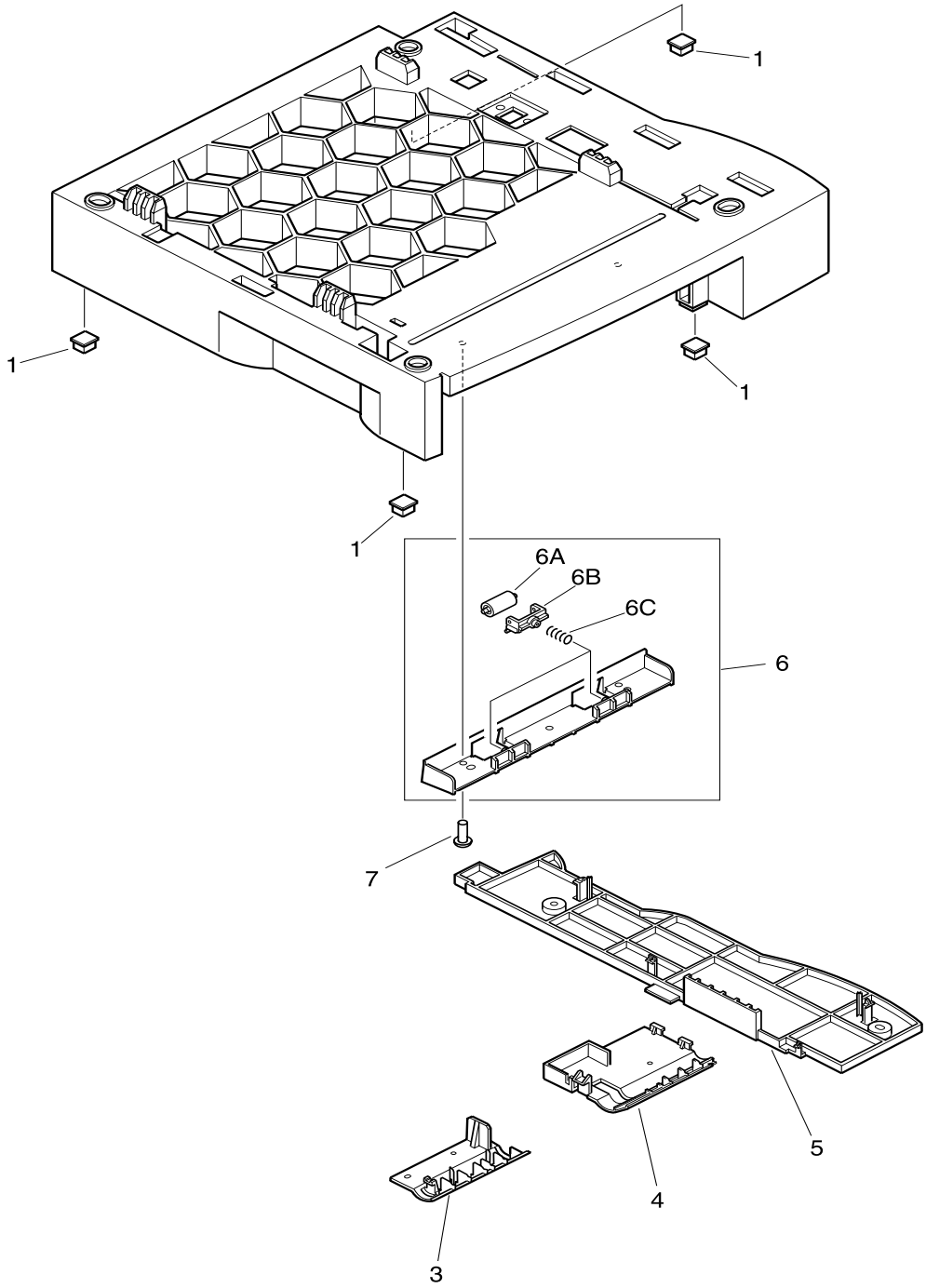


Figure 188. **250-sheet feeder external covers**

Table 56. 250-sheet feeder external covers

Ref	Description	Part number	Qty
1	Foot	RB2-2816-000CN	4
3	Cover, lower left	RB2-3489-000CN	1
4	Cover, lower right	RB2-3479-000CN	1
5	Cover, drive	RB2-3480-000CN	1
6	Lower feed roller assembly	RG5-4394-000CN	1
6A	Roller	RB2-3484-000CN	2
6B	Holder, roller	RB2-3485-000CN	2
6C	Spring, compression	RS6-2063-000CN	2
7	Screw, M4 by 8	XA9-0605-000CN	3

Tray 2 and 250-sheet feeder cassette

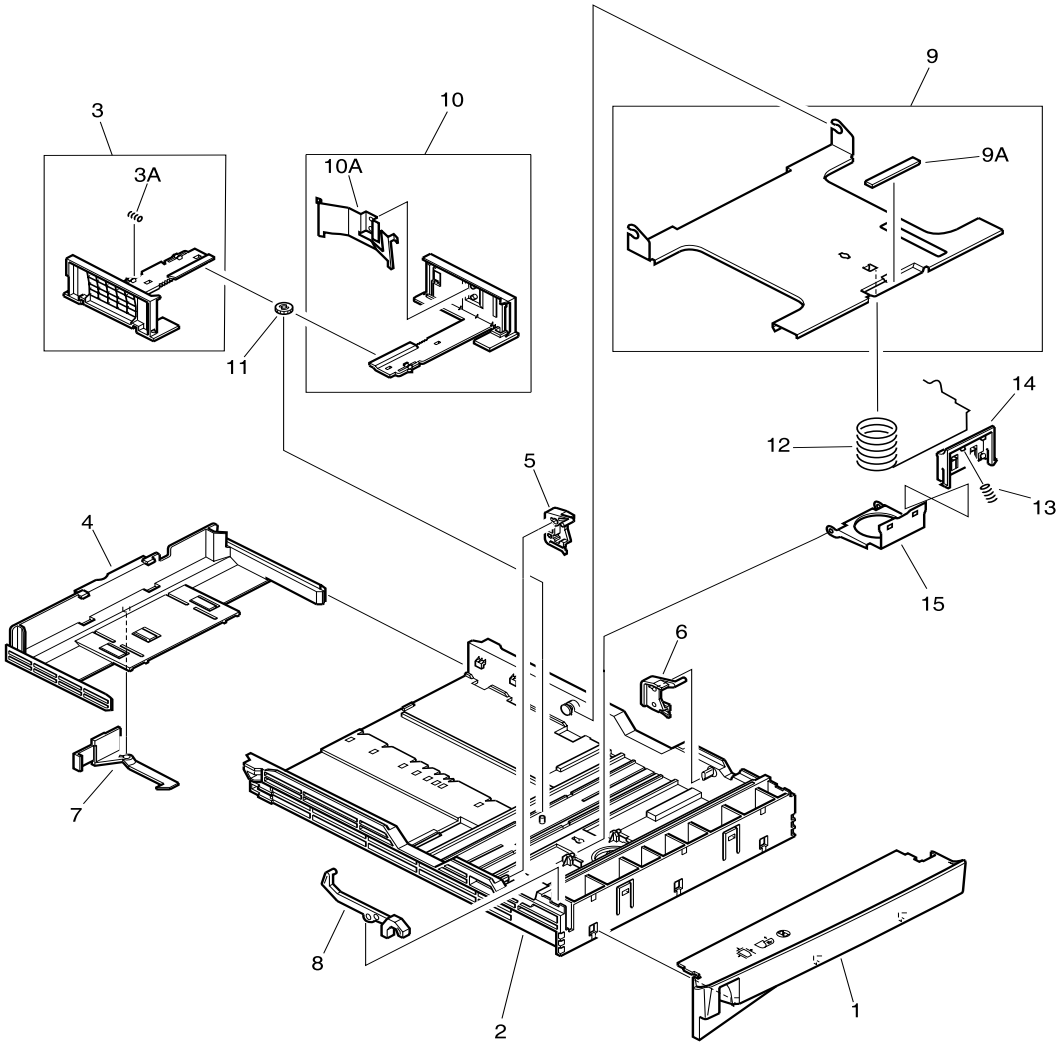


Figure 189. **Tray 2 and 250-sheet feeder cassette**

Table 57. Tray 2 and 250-sheet feeder cassette

Ref	Description	Part number	Qty
	Cassette assembly (250-sheet)	RG5-5580-000CN	1
1	Cover, front	RB2-3000-000CN	1
2	Body, cassette	RB2-3001-040CN	1
3	Left side plate assembly	RG5-4159-000CN	1
3A	Spring, compression	RS6-2035-000CN	1
4	Plate, end	RB2-3003-000CN	1
5	Arm, release, left	RB2-3004-000CN	1
6	Arm, release, right	RB2-3005-000CN	1
7	Arm, lock	RB2-3009-000CN	1
8	Arm, paper level	RB2-3010-000CN	1
9	Plate, paper lifting	RF5-2599-000CN	1
9A	Sheet, separation	RB2-3007-000CN	1
10	Right side plate assembly	RF5-2606-020CN	1
10A	Spring, leaf	RB2-3012-000CN	1
11	Gear, 10T	RS6-0440-000CN	1
12	Spring, compression	RS6-2020-000CN	1
13	Spring, compression	RS6-2021-000CN	1
14	Pad, separation, tray 2	RB2-6349-000CN	1
14	Pad, separation, 250-sheet feeder	RB2-3008-000CN	1
15	Holder, separation pad	RB2-3013-000CN	1

250-sheet feeder internal components

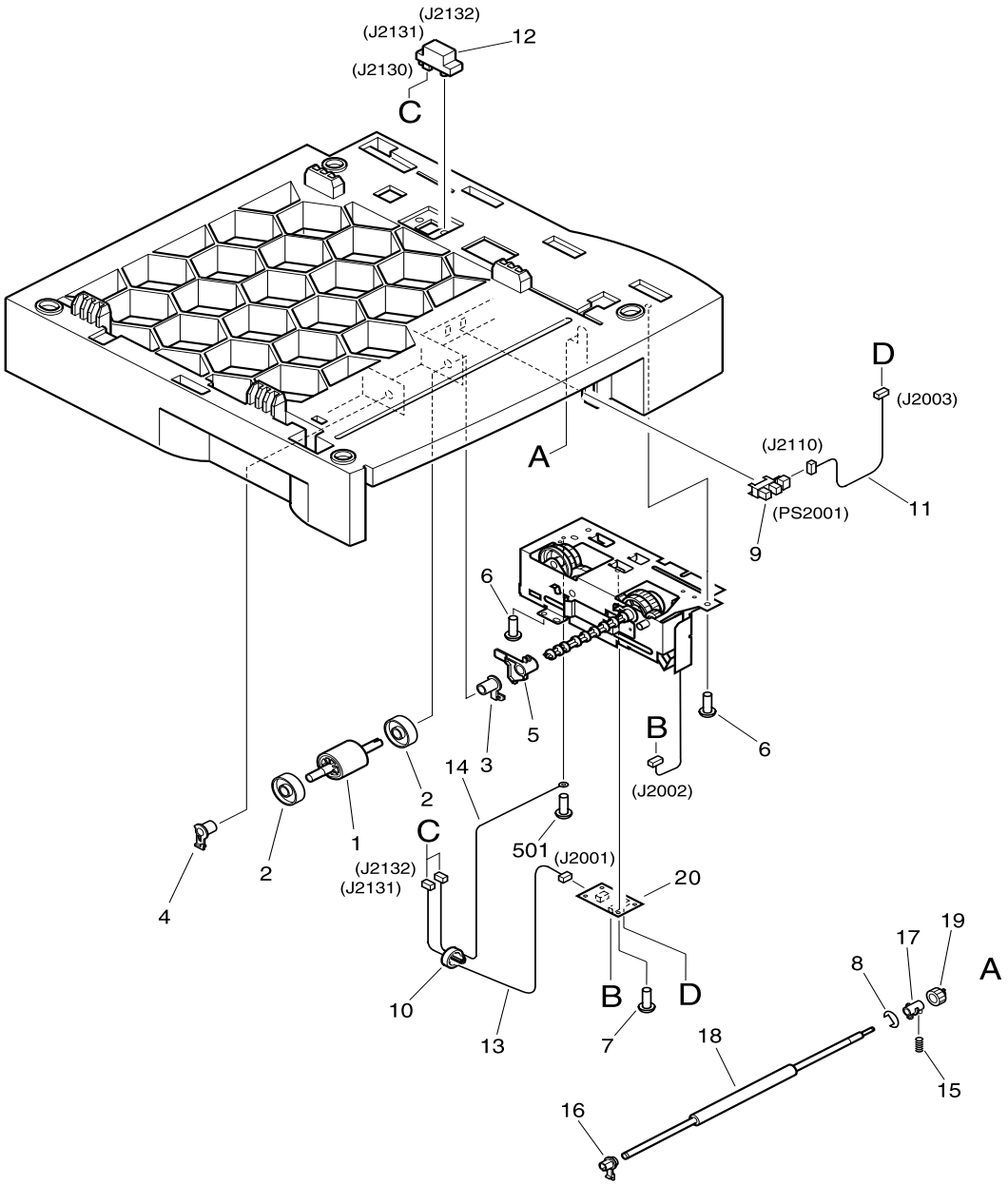


Figure 190. **250-sheet feeder internal components**

Table 58. 250-sheet feeder internal components

Ref	Description	Part number	Qty
1	Roller, paper pick-up	RB2-2891-000CN	1
2	Roller	RB2-2892-000CN	2
3	Bushing, right	RB2-2895-000CN	1
4	Bushing, left	RB2-2896-000CN	1
5	Lever, sensor	RB2-3474-000CN	1
6	Screw, M4 by 8	XA9-0605-000CN	3
7	Screw, w/washer M3 by 8	XA9-0924-000CN	2
8	E-ring	XD9-0136-000CN	1
9	Photo-interrupter TLP1242	WG8-5382-000CN	1
11	Sensor cable	RG5-4278-000CN	1
12	Connector, 6P	VS1-6174-006CN	1
13	Relay cable	RG5-4280-000CN	1
14	FG cable	RG5-4281-000CN	1
15	Spring, compression	RS6-2064-000CN	1
16	Bushing, left	RB2-6470-000CN	1
17	Bushing, right	RB2-3487-000CN	1
18	Roller, feed	RB2-3490-000CN	1
19	Gear, 15T	RS6-0501-000CN	1
20	Drive PCB, paper feeder	RG5-4277-000CN	1
501	Screw, w/washer M4 by 6	XB2-7400-607CN	1

250-sheet feeder drive assembly

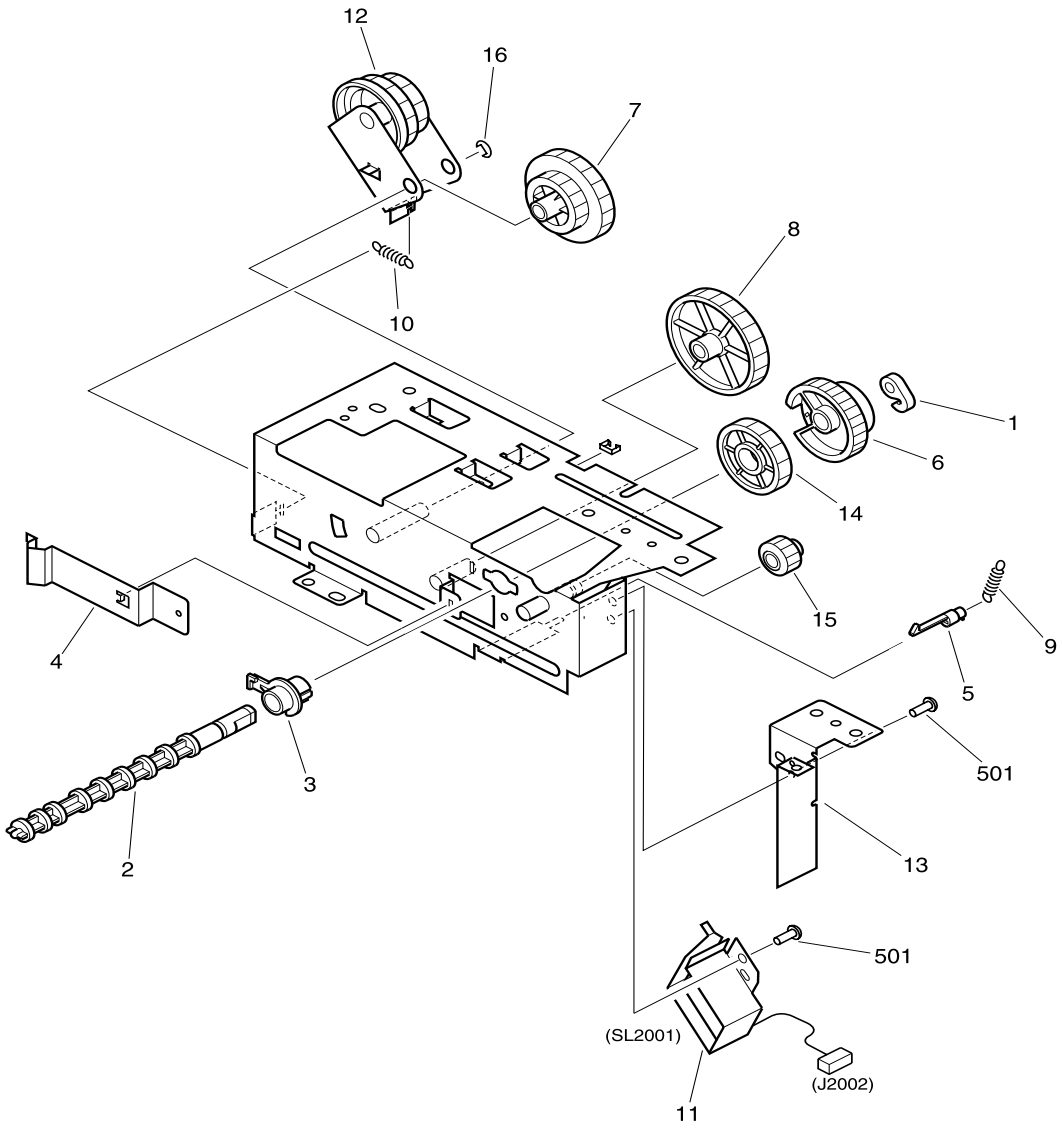


Figure 191. **250-sheet feeder drive assembly**

Table 59. 250-sheet feeder drive assembly

Ref	Description	Part number	Qty
	Paper feeder drive assembly	RG5-4391-040CN	1
1	Collar, spring	RB1-2190-000CN	1
2	Shaft, drive	RB2-2893-000CN	1
3	Bushing	RB2-3475-000CN	1
4	Spring, leaf	RB2-3478-000CN	1
5	Holder, spring	RB1-6133-000CN	1
6	Gear, 27T	RS6-0495-000CN	1
7	Gear, 39T/34T	RS6-1497-000CN	1
8	Gear, 45T	RS6-0498-000CN	1
9	Spring, tension	RS6-2061-000CN	1
10	Spring, tension	RS6-2062-000CN	1
11	Solenoid	RH7-5213-000CN	1
12	Swing gear assembly	RF5-2755-000CN	1
13	Plate	RB2-3481-020CN	1
14	Gear, 39T	RS6-0499-000CN	1
15	Gear, 17T	RS6-0500-000CN	1
16	E-ring	XD9-0136-000CN	1
501	Screw, TP, M4 by 6	XB6-7400-609CN	3

250-sheet feeder PCB assembly location

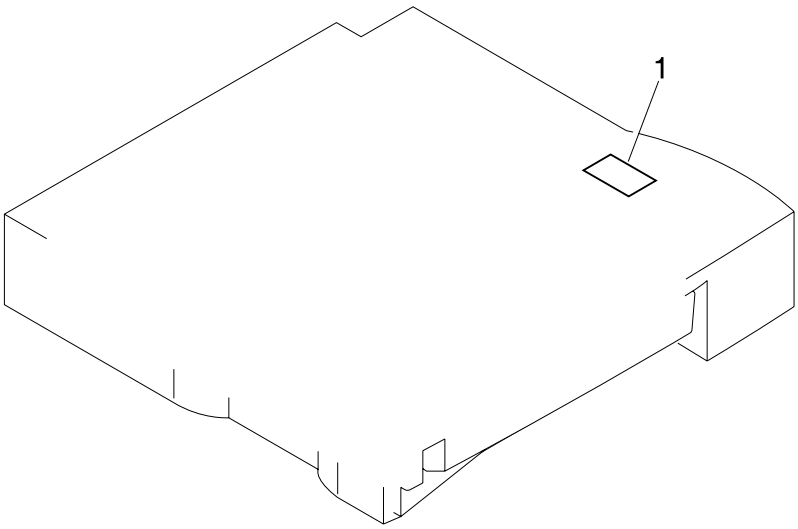


Figure 192. **250-sheet feeder PCB assembly location**

Table 60. 250-sheet feeder PCB assembly location

Ref	Description	Part number	Qty
1	Paper feeder driver PCB assembly	RG5-4277-000CN	1

500-sheet feeder external covers

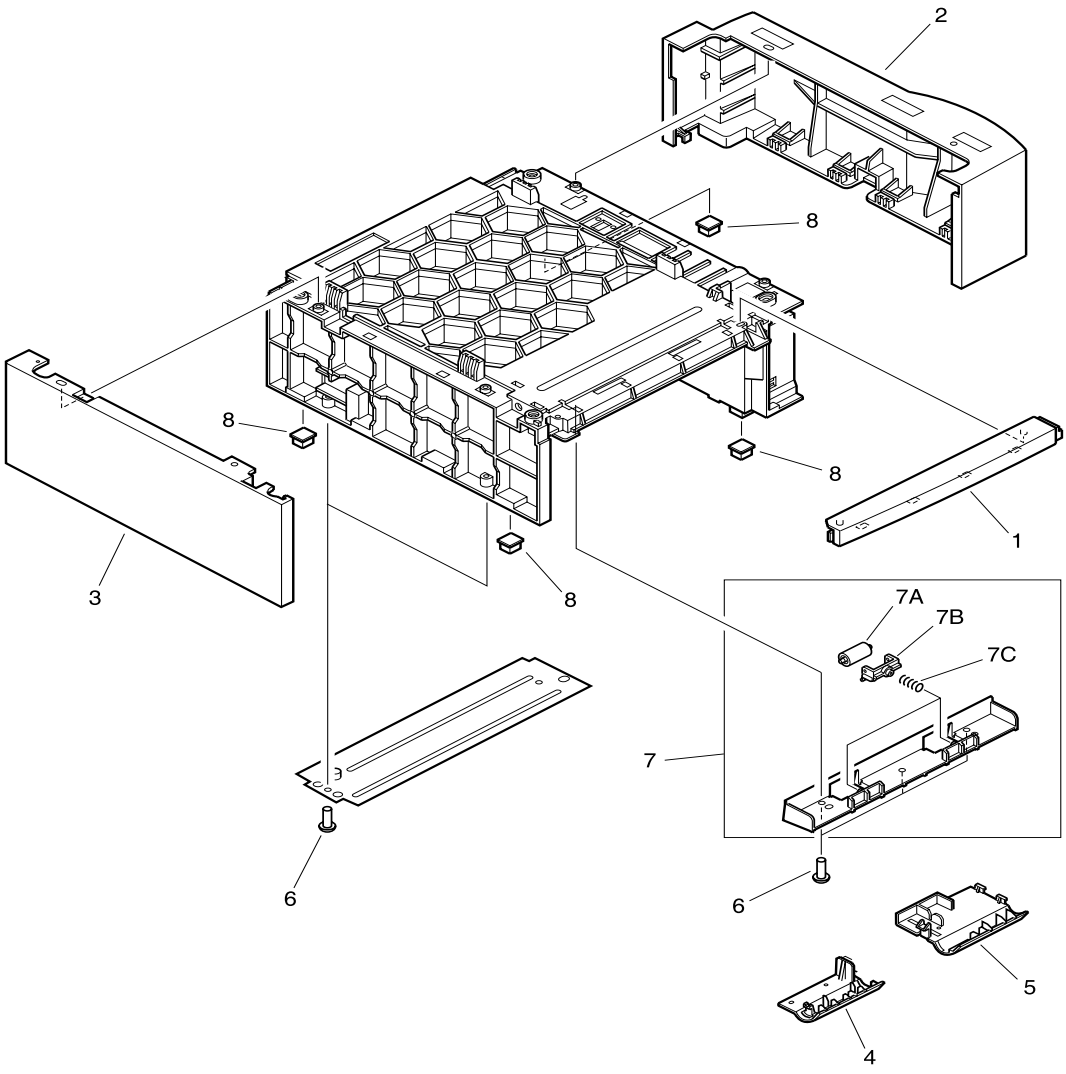


Figure 193. **500-sheet feeder external covers**

Table 61. 500-sheet feeder external covers

Ref	Description	Part number	Qty
1	Cover, front	RB2-6454-000CN	1
2	Cover, right	RB2-6456-000CN	1
3	Cover, left	RB26457-000CN	1
4	Cover, lower left	RB2-3489-000CN	1
5	Cover, sensor	RB2-6453-000CN	1
6	Screw, M4 by 8	XA9-0605-000CN	7
7	Lower feed roller assembly	RG5-4394-020CN	1
7A	Roller	RB2-3484-020CN	2
7B	Holder, roller	RB2-3485-000CN	2
7C	Spring, compression	RB2-2063-000CN	2
8	Foot	RB2-6297-000CN	4

500-sheet feeder cassette

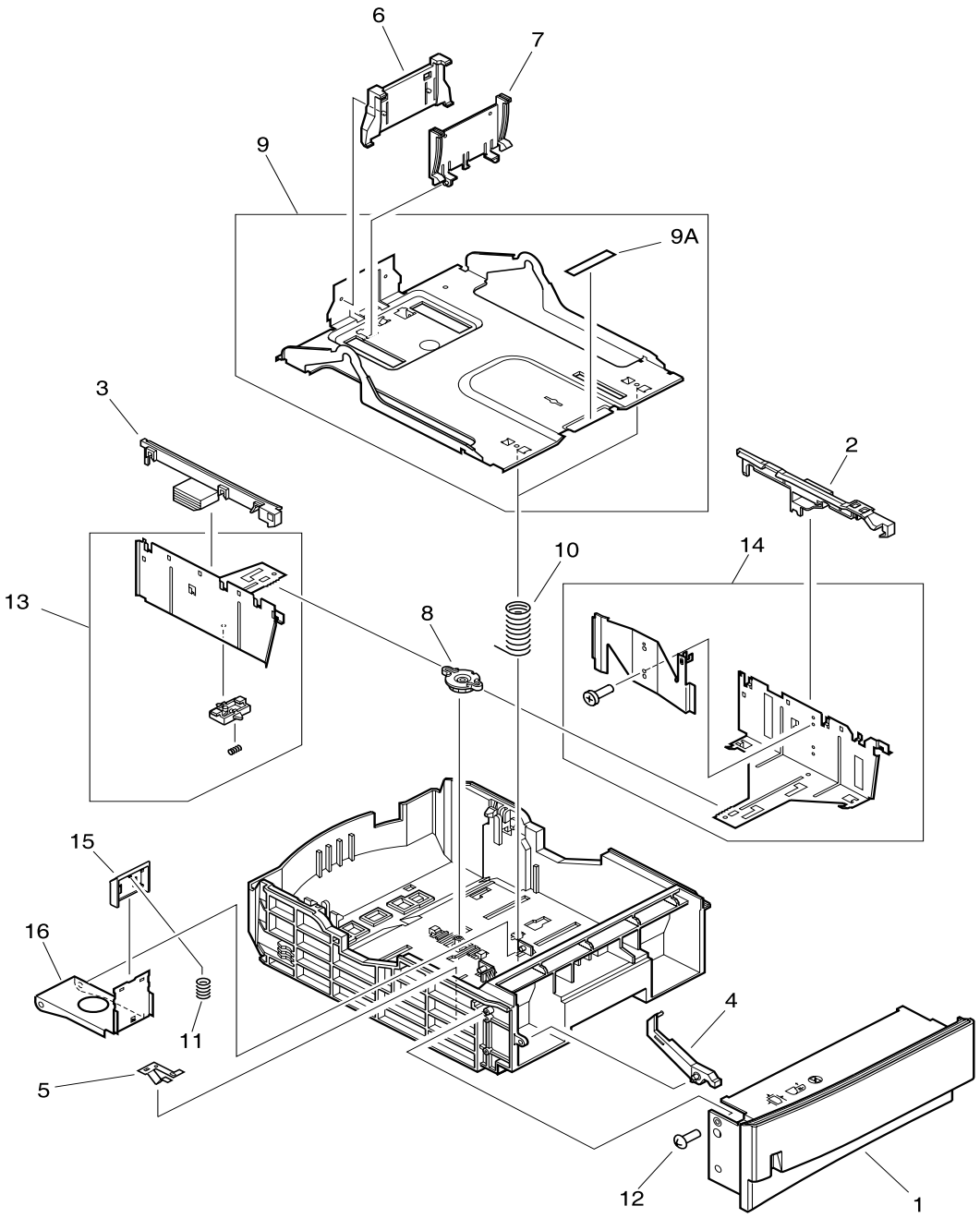


Figure 194. **500-sheet feeder cassette**

Table 62. 500-sheet feeder cassette

Ref	Description	Part number	Qty
	Cassette	RG5-5623-000CN	1
1	Cover, front	RB2-6468-000CN	1
2	Cover, right edge	RB2-6463-000CN	1
3	Cover, left edge	RB2-6464-000CN	1
4	Arm, paper level	RB2-6465-000CN	1
5	Plate, grounding	RB2-6466-000CN	1
6	Cover, rear edge	RB2-6467-000CN	1
7	Plate, end	RB2-6469-000CN	1
8	Gear, 20T	RB2-6471-000CN	1
9	Plate, paper lifting	RF5-3303-000CN	1
9A	Sheet, separation	RB2,3007-000CN	1
10	Spring, compression	RS6-2395-000CN	2
11	Spring, compression	RS6-2396-000CN	1
12	Screw, M4 by 10	XA9-0606-000CN	2
13	Left side, plate assembly	RG5-5626-000CN	1
14	right side, plate assembly	RG5-5627-000CN	1
15	Pad, separation	RB2-6474-000CN	1
16	Arm, pad	RB2-6459-000CN	1

500-sheet feeder internal components

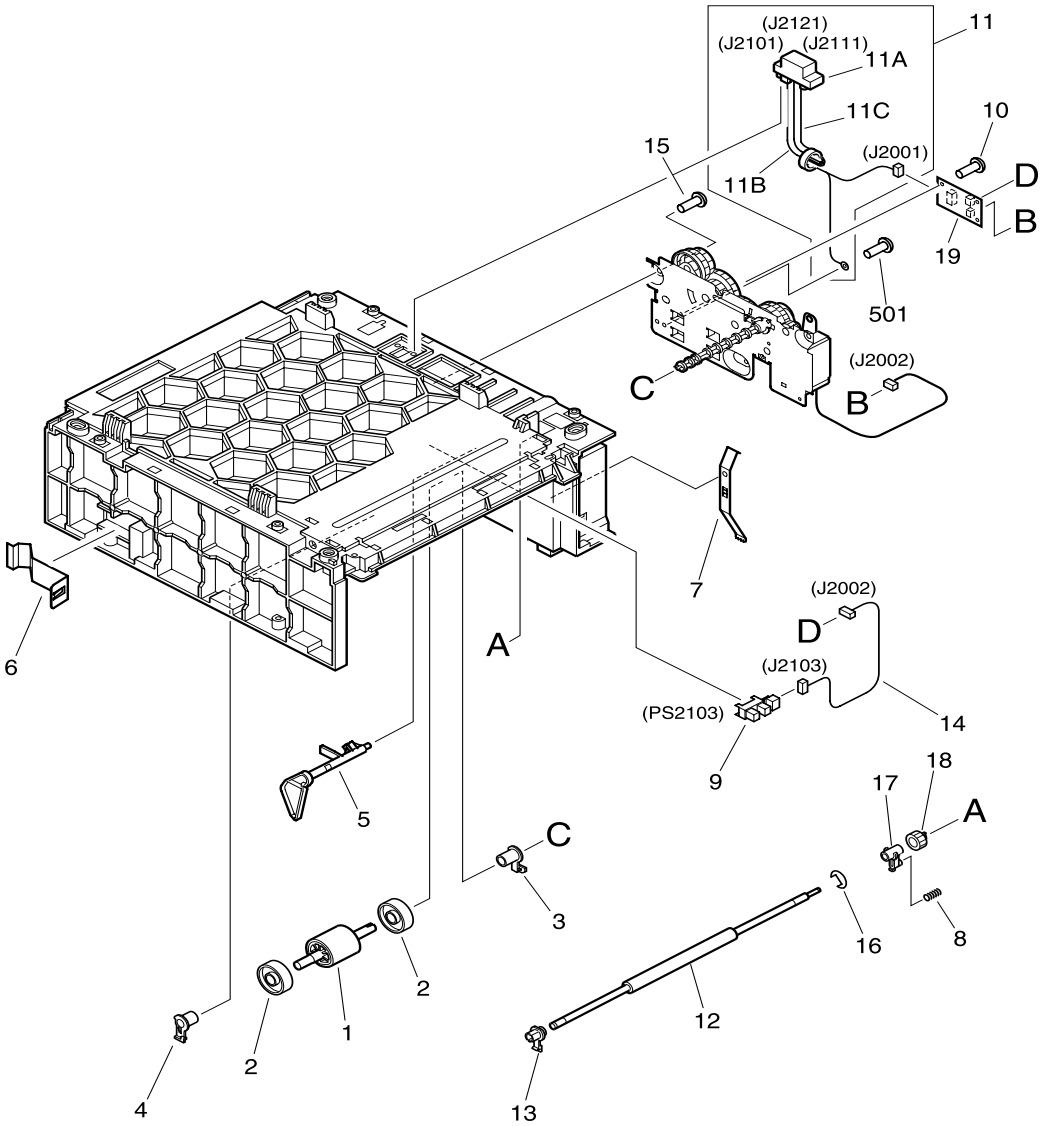


Figure 195. **500-sheet feeder internal components**

Table 63. 500-sheet feeder internal components

Ref	Description	Part number	Qty
1	Roller, paper pick-up	RB2-6304-000CN	1
2	Roller	RB2-2892-000CN	2
3	Bushing, right	RB2-2895-000CN	1
4	Bushing, left	RB2-2896-000CN	1
5	Arm, sensor	RB2-6448-000CN	1
6	Spring, leaf	RB2-6450-000CN	1
7	Spring, leaf	RB2-6451-000CN	1
8	Spring, compression	RS6-2064-000CN	1
9	Photo-interrupter GP1SQ73P	WG8-5364-000CN	1
10	Screw w/washer M3 by 8	XA9-1226-000CN	1
11	Paper feeder cable	RG5-4279-000CN	1
11A	Connector 6P	VS1-6174-006CN	1
11B	Relay cable	RG5-4280-000CN	1
11C	FG cable	RG5-4281-000CN	1
12	Roller, feed	RB2-6476-000CN	1
13	Bushing	RB2-6447-000CN	1
14	Sensor Cable	RG5-5631-000CN	1
15	Screw, M4 by 8	XA9-0605-000CN	3
16	E-ring	XD9-0136-000CN	1
17	Bushing	RB2-6470-000CN	1
18	Gear, 15T	RS6-0501-000CN	1
19	Drive PCB, paper feeder	RG5-5630-000CN	1
501	Screw, w/washer, M4 by 6	XB2-7400-607CN	1

500-sheet feeder drive assembly

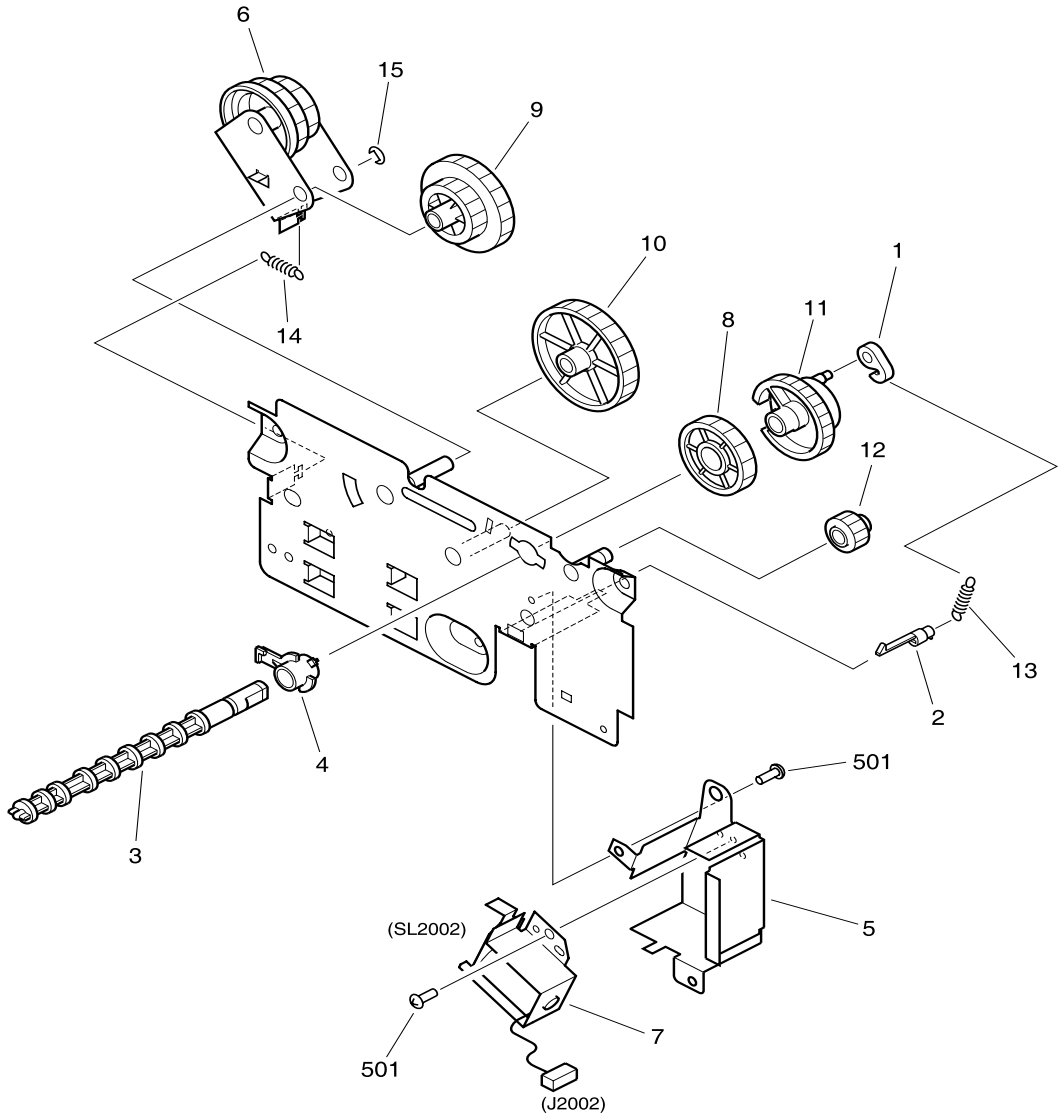


Figure 196. **500-sheet feeder drive assembly**

Table 64. 500-sheet feeder drive assembly

Ref	Description	Part number	Qty
	Paper feeder drive assembly	RG5-5622-000CN	1
1	Collar, spring	RB1-2190-000CN	1
2	Holder, spring	RB1-6133-000CN	1
3	Shaft, drive	RB2-2893-000CN	1
4	Bushing	RB2-6455-000CN	1
5	Plate, solenoid cross member	RB2-6473-000CN	1
6	Gear, 31T/26T	RF5-3304-000CN	1
7	Solenoid	RH7-5276-000CN	1
8	Gear, 39T	RS6-0499-000CN	1
9	Gear, 40T/24T	RS6-0945-000CN	1
10	Gear, 70T	RS6-0946-000CN	1
11	Gear, 34T	RS6-0947-000CN	1
12	Gear, 17T	RS6-0948-000CN	1
13	Spring, tension	RS6-2061-000CN	1
14	Spring, tension	RS6-2397-000CN	1
15	E-ring	XD9-0136-000CN	1
501	Screw, TP, M4 by 8	XB6-7400-809CN	3

500-sheet feeder PCB assembly location

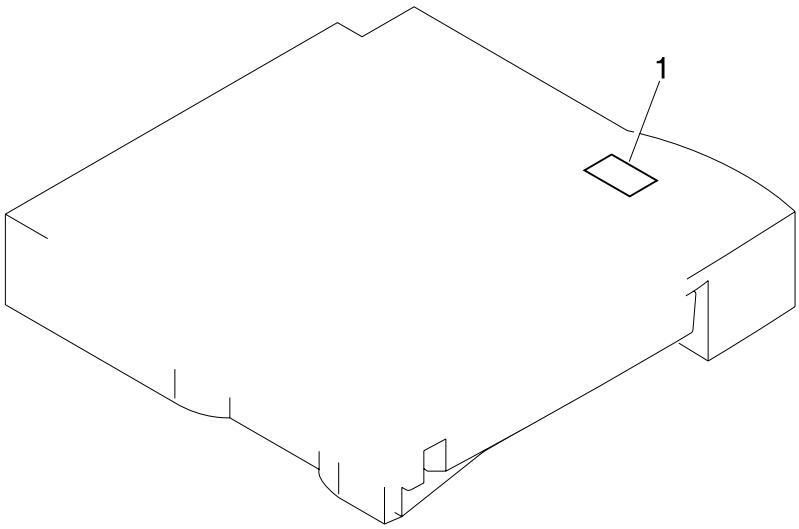


Figure 197. **500-sheet feeder PCB assembly location**

Table 65. 500-sheet feeder PCB assembly location

Ref	Description	Part number	Qty
1	Paper feeder driver PCB assembly	RG5-5630-000CN	1

Alphabetical parts list

Table 66. Alphabetical parts list

Description	Part number	Table and page
Arm, drive	RB2-6376-000CN	Table 52 on page 8-248
Arm, lock	RB2-3009-000CN	Table 57 on page 8-258
Arm, pad	RB2-6459-000CN	Table 62 on page 8-268
Arm, paper level	RB2-3010-000CN	Table 57 on page 8-258
Arm, paper level	RB2-6465-000CN	Table 62 on page 8-268
Arm, paper sensor	RB2-6310-000CN	Table 53 on page 8-250
Arm, release, left	RB2-3004-000CN	Table 57 on page 8-258
Arm, release, right	RB2-3005-000CN	Table 57 on page 8-258
Arm, roller holder	RB2-6309-000CN	Table 53 on page 8-250
Arm, sensor	RB2-6264-000CN	Table 48 on page 8-240
Arm, sensor	RB2-6448-000CN	Table 63 on page 8-270
Belt, paper feed, 1	RB2-6272-000CN	Table 49 on page 8-242
Belt, paper feed, 2	RB2-6273-000CN	Table 49 on page 8-242
Belt, paper feed, 3	RB2-6270-000CN	Table 49 on page 8-242
Body, cassette	RB2-3001-040CN	Table 57 on page 8-258
Bushing	RB2-2850-000CN	Table 48 on page 8-240
Bushing	RB2-2936-000CN	Table 52 on page 8-248
Bushing	RB2-2897-000CN	Table 53 on page 8-250
Bushing	RB2-3081-000CN	Table 53 on page 8-250
Bushing	RB2-6303-000CN	Table 53 on page 8-250
Bushing	RB2-2973-000CN	Table 54 on page 8-252
Bushing	RB2-6359-000CN	Table 54 on page 8-252
Bushing	RB2-6370-000CN	Table 54 on page 8-252
Bushing	RB2-6371-000CN	Table 54 on page 8-252
Bushing	RB2-6470-000CN	Table 58 on page 8-260
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Bushing	RB2-6447-000CN	Table 63 on page 8-270
Bushing	RB2-6470-000CN	Table 63 on page 8-270
Bushing	RB2-6455-000CN	Table 64 on page 8-272
Bushing, left	RB2-3043-000CN	Table 48 on page 8-240
Bushing, left	RB2-2896-000CN	Table 53 on page 8-250
Bushing, left	RB2-2896-000CN	Table 58 on page 8-260
Bushing, left	RB2-3487-000CN	Table 58 on page 8-260
Bushing, left	RB2-2896-000CN	Table 63 on page 8-270
Bushing, right	RB2-3044-000CN	Table 48 on page 8-240
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Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
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Bushing, right	RB2-2895-000CN	Table 63 on page 8-270
Bushing, transfer, right	RB2-2926-020CN	Table 48 on page 8-240
Cable, flat	RH2-5421-000CN	Table 51 on page 8-246
Cassette	RG5-5623-000CN	Table 62 on page 8-268
Cassette assembly (250-sheet)	RG5-5580-000CN	Table 57 on page 8-258
Cassette pick-up assembly	RG5-5551-000CN	Table 53 on page 8-250
Cassette pick-up gear assembly	RG5-4156-000CN	Table 48 on page 8-240
Collar, spring	RB1-2190-000CN	Table 59 on page 8-262
Collar, spring	RB1-2190-000CN	Table 64 on page 8-272
Connector 6P	VS1-6174-006CN	Table 63 on page 8-270
Connector, 6P	VS1-6174-006CN	Table 58 on page 8-260
Coupling assembly	RG9-1473-000CN	Table 52 on page 8-248
Cover assembly, tray 1	RG5-4121-000CN	Table 44 on page 8-232
Cover rear	RG5-5546-000CN	Table 44 on page 8-232
Cover, cartridge	RB2-2856-000CN	Table 45 on page 8-234
Cover, drive	RB2-3480-000CN	Table 56 on page 8-256
Cover, front	RB2-3000-000CN	Table 57 on page 8-258
Cover, front	RB2-6454-000CN	Table 61 on page 8-266
Cover, front	RB2-6468-000CN	Table 62 on page 8-268
Cover, left	RB2-6457-000CN	Table 61 on page 8-266
Cover, left edge	RB2-6464-000CN	Table 62 on page 8-268
Cover, lower left	RB2-3489-000CN	Table 56 on page 8-256
Cover, lower right	RB2-3479-000CN	Table 56 on page 8-256
Cover, lower, left	RB2-3489-000CN	Table 61 on page 8-266
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Cover, sensor	RB2-6453-000CN	Table 61 on page 8-266
Cover, top	RB2-6280-000CN	Table 45 on page 8-234
Damper	RB2-6248-000CN	Table 48 on page 8-240
DIMM cover assembly	RG5-5545-000CN	Table 44 on page 8-232
Duplex feed guide assembly	RG5-5554-000CN	Table 50 on page 8-244
Duplex solenoid assembly	RG5-5552-000CN	Table 50 on page 8-244
Eliminator, static charge	RB2-6261-000CN	Table 46 on page 8-236
Engine control assembly	RG5-5566-000CN	Table 47 on page 8-238
E-ring	XD9-0135-000CN	Table 53 on page 8-250
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E-ring	XD9-0136-000CN	Table 59 on page 8-262
E-ring	XD9-0136-000CN	Table 63 on page 8-270

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
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Expansion, tray 1	RB2-3037-000CN	Table 44 on page 8-232
Fan	RH7-1463-000CN	Table 46 on page 8-236
FD delivery roller assembly	RG5-5541-000CN	Table 48 on page 8-240
FD delivery roller assembly	RG5-5542-000CN	Table 48 on page 8-240
Feed roller assembly	RG5-5555-000CN	Table 50 on page 8-244
FG cable	RG5-4281-000CN	Table 58 on page 8-260
FG cable	RG5-4281-000CN	Table 63 on page 8-270
Flange, spring	RB2-2950-000CN	Table 52 on page 8-248
Flat cable, I/F	RH2-5423-000CN	Table 46 on page 8-236
Flat cable, laser	RH2-5427-000CN	Table 46 on page 8-236
Flat cable, reverse motor	RH2-5425-000CN	Table 47 on page 8-238
Foot	RB2-2816-000CN	Table 56 on page 8-256
Foot, rubber	RB2-6297-000CN	Table 48 on page 8-240
Foot, rubber	RB2-6297-000CN	Table 61 on page 8-266
Formatter PCB	C4209-60001	Table 47 on page 8-238
Frame, feeder	RB2-3471-000CN	Table 56 on page 8-256
Fuse, 125 V, 15A, 100 to 127 V	WD1-0268-000CN	Table 51 on page 8-246
Fuse, 250 V, 8 A, 220 to 240 V	RH3-8006-000CN	Table 51 on page 8-246
Fuser assembly 110 V	RG5-5559-000CN	Table 54 on page 8-252
Fuser assembly 220 V	RG5-5569-000CN	Table 54 on page 8-252
Fuser film assembly 110 V	RG5-5560-000CN	Table 54 on page 8-252
Fuser film assembly 220 V	RG5-5570-000CN	Table 54 on page 8-252
Gear assembly	RG5-5577-000CN	Table 49 on page 8-242
Gear assembly	RG5-5577-000CN	Table 49 on page 8-242
Gear, 10T	RS6-0440-000CN	Table 57 on page 8-258
Gear, 14T	RS6-0445-000CN	Table 48 on page 8-240
Gear, 14T	RS6-0921-000CN	Table 54 on page 8-252
Gear, 15T	RS6-0441-000CN	Table 48 on page 8-240
Gear, 15T	RS6-0904-000CN	Table 53 on page 8-250
Gear, 15T	RS6-0906-000CN	Table 53 on page 8-250
Gear, 15T	RS6-0501-000CN	Table 58 on page 8-260
Gear, 15T	RS6-0501-000CN	Table 63 on page 8-270
Gear, 16T	RS6-0905-000CN	Table 53 on page 8-250
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Gear, 17T	RS6-0913-000CN	Table 52 on page 8-248
Gear, 17T	RS6-0500-000CN	Table 59 on page 8-262
Gear, 17T	RS6-0948-000CN	Table 64 on page 8-272

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Gear, 17T/68T	RS6-0448-000CN	Table 52 on page 8-248
Gear, 201T	RS6-0446-000CN	Table 52 on page 8-248
Gear, 20T	RS6-0464-000CN	Table 49 on page 8-242
Gear, 20T	RB2-6471-000CN	Table 62 on page 8-268
Gear, 24T	RS6-0907-000CN	Table 53 on page 8-250
Gear, 25T/41T	RS6-0449-000CN	Table 52 on page 8-248
Gear, 26T	RB2-3040-000CN	Table 48 on page 8-240
Gear, 26T	RS6-0451-000CN	Table 52 on page 8-248
Gear, 27T	RS6-0923-000CN	Table 54 on page 8-252
Gear, 27T	RS6-0495-000CN	Table 59 on page 8-262
Gear, 28T/88T	RS6-0916-000CN	Table 52 on page 8-248
Gear, 31T	RS6-0450-000CN	Table 52 on page 8-248
Gear, 31T/26T	RF5-3304-000CN	Table 64 on page 8-272
Gear, 34T	RS6-0947-000CN	Table 64 on page 8-272
Gear, 39T	RS6-0915-000CN	Table 52 on page 8-248
Gear, 39T	RS6-0499-000CN	Table 59 on page 8-262
Gear, 39T	RS6-0499-000CN	Table 64 on page 8-272
Gear, 39T/34T	RS6-0497-000CN	Table 59 on page 8-262
Gear, 40T/24T	RS6-0945-000CN	Table 64 on page 8-272
Gear, 42T	RS6-0911-000CN	Table 52 on page 8-248
Gear, 45T	RS6-0498-000CN	Table 59 on page 8-262
Gear, 46T/22T	RS6-0914-000CN	Table 52 on page 8-248
Gear, 70T	RS6-0946-000CN	Table 64 on page 8-272
Gear, 75T	RS6-0917-000CN	Table 52 on page 8-248
Gear, 75T/28T	RS6-0918-000CN	Table 52 on page 8-248
Gear, 79T/36T	RS6-0919-000CN	Table 52 on page 8-248
Gear, 91T/28T	RS6-0910-000CN	Table 52 on page 8-248
Gear, 93T/73T	RS6-0912-000CN	Table 52 on page 8-248
Guide	RB2-2944-000CN	Table 52 on page 8-248
Guide, cable	RG5-5568-000CN	Table 49 on page 8-242
Guide, cartridge, left	RB2-2831-000CN	Table 48 on page 8-240
Guide, cartridge, right	RB2-2830-000CN	Table 48 on page 8-240
Guide, delivery, lower	RB2-6350-000CN	Table 54 on page 8-252
Guide, delivery, upper	RG5-5561-000CN	Table 54 on page 8-252
Guide, entrance	RB2-6357-000CN	Table 54 on page 8-252
Guide, flat cable	RB2-6247-000CN	Table 46 on page 8-236
Hinge, feed guide	RB2-6249-000CN	Table 50 on page 8-244
Hinge, left	RB2-3041-000CN	Table 49 on page 8-242
Hinge, right	RB2-3042-000CN	Table 49 on page 8-242
Holder, contact	RF5-2609-000CN	Table 54 on page 8-252

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Holder, pin	RB2-2947-000CN	Table 52 on page 8-248
Holder, roller	RB2-3485-000CN	Table 56 on page 8-256
Holder, roller	RB2-3485-000CN	Table 61 on page 8-266
Holder, sensor lever	RF5-3279-000CN	Table 46 on page 8-236
Holder, separation pad	RB2-3013-000CN	Table 57 on page 8-258
Holder, spring	RB1-6133-000CN	Table 59 on page 8-262
Holder, spring	RB1-6133-000CN	Table 64 on page 8-272
Inlet cable unit	RG5-5565-000CN	Table 46 on page 8-236
Laser/scanner assembly	RG5-5591-000CN	Table 46 on page 8-236
Left cover assembly	RG5-5549-000CN	Table 44 on page 8-232
Left side plate assembly	RG5-4159-000CN	Table 57 on page 8-258
Left side, plate assembly	RG5-5626-000CN	Table 62 on page 8-268
Lever, delivery	RB2-6351-000CN	Table 54 on page 8-252
Lever, drive release	RB9-0641-000CN	Table 52 on page 8-248
Lever, jam clearing	RB2-6251-000CN	Table 48 on page 8-240
Lever, sensor	RB2-2836-000CN	Table 46 on page 8-236
Lever, sensor	RB2-3474-000CN	Table 58 on page 8-260
Lower feed roller assembly	RG5-4394-000CN	Table 56 on page 8-256
Lower feed roller assembly	RG5-4394-020CN	Table 61 on page 8-266
Microswitch	RH7-6051-000CN	Table 46 on page 8-236
Motor, 23 V, dc	RH7-1461-000CN	Table 52 on page 8-248
Motor, dc, 5 to 76W	RH7-1458-000CN	Table 46 on page 8-236
Mount, fan	RB2-6255-000CN	Table 46 on page 8-236
MP pick-up assembly	RG5-4128-000CN	Table 48 on page 8-240
Pad, separation	RF5-3272-000CN	Table 49 on page 8-242
Pad, separation	RB2-3008-000CN	Table 57 on page 8-258
Pad, separation	RB2-6474-000CN	Table 62 on page 8-268
Paper feeder cable	RG5-4279-000CN	Table 63 on page 8-270
Paper feeder drive assembly	RG5-4391-000CN	Table 59 on page 8-262
Paper feeder drive assembly	RG5-5622-000CN	Table 64 on page 8-272
Paper feeder drive PCB assembly	RG5-4277-000CN	Table 58 on page 8-260
Paper feeder drive PCB assembly	RG5-4277-000CN	Table 60 on page 8-264
Paper feeder driver PCB assembly	RG5-5630-000CN	Table 65 on page 8-274
Paper-feed cable	RG5-5598-000CN	Table 46 on page 8-236
Photo-interrupter GP1SQ73P	WG8-5364-000CN	Table 63 on page 8-270
Photo-interrupter, GP1SQ73P	WG8-5364-000CN	Table 53 on page 8-250
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 48 on page 8-240
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 49 on page 8-242
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 54 on page 8-252
Photo-interrupter, TLP1242	WG8-5382-000CN	Table 58 on page 8-260

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Pin	RB2-2943-000CN	Table 52 on page 8-248
Plate	RB2-3481-000CN	Table 59 on page 8-262
Plate, end	RB2-6349-000CN	Table 57 on page 8-258
Plate, end	RB2-6469-000CN	Table 62 on page 8-268
Plate, feeding, left	RB2-3078-000CN	Table 49 on page 8-242
Plate, feeding, right	RB2-3079-000CN	Table 49 on page 8-242
Plate, grounding	RB2-6246-000CN	Table 46 on page 8-236
Plate, grounding	RB2-3080-000CN	Table 49 on page 8-242
Plate, grounding	RB2-6466-000CN	Table 62 on page 8-268
Plate, motor	RB2-6377-000CN	Table 52 on page 8-248
Plate, mount	RB2-2945-000CN	Table 52 on page 8-248
Plate, paper lifting	RF5-2599-000CN	Table 57 on page 8-258
Plate, paper lifting	RF5-3303-000CN	Table 62 on page 8-268
Plate, Pressure	RB2-6358-000CN	Table 54 on page 8-252
Plate, protection	RB2-6252-000CN	Table 46 on page 8-236
Plate, solenoid cross member	RB2-6473-000CN	Table 64 on page 8-272
Plate, spring	RB2-6378-000CN	Table 52 on page 8-248
Position guide assembly	RG5-5553-000CN	Table 50 on page 8-244
Power supply assembly 220 to 240 V	RG5-5573-000CN	Table 51 on page 8-246
Power supply assembly, 100 to127 V	RG5-5563-000CN	Table 51 on page 8-246
Printer drive assembly	RG5-5562-000CN	Table 52 on page 8-248
Pulley	RB2-6268-000CN	Table 49 on page 8-242
Registration assembly	RG5-5556-000CN	Table 48 on page 8-240
Relay cable	RG5-4280-000CN	Table 58 on page 8-260
Relay cable	RG5-4280-000CN	Table 63 on page 8-270
Reverse guide assembly	RG5-5548-000CN	Table 50 on page 8-244
RFI shield, formatter	C7058-00001	Table 47 on page 8-238
Right side plate assembly	RF5-2606-000CN	Table 57 on page 8-258
right side, plate assembly	RG5-5627-000CN	Table 62 on page 8-268
Rod, jam clearing	RB2-6250-000CN	Table 48 on page 8-240
Roller	RB2-2892-000CN	Table 53 on page 8-250
Roller	RB2-3046-000CN	Table 53 on page 8-250
Roller	RB2-3484-000CN	Table 56 on page 8-256
Roller	RB2-2892-000CN	Table 58 on page 8-260
Roller	RB2-2892-000CN	Table 63 on page 8-270
Roller, delivery	RB2-6372-000CN	Table 54 on page 8-252
Roller, delivery	RB2-6374-000CN	Table 54 on page 8-252
Roller, face-down lower 1	RB2-2849-000CN	Table 48 on page 8-240
Roller, face-down lower 1	RB2-2849-000CN	Table 48 on page 8-240
Roller, face-down lower 2	RB2-6277-000CN	Table 48 on page 8-240

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Roller, face-down, upper	RF5-3275-000CN	Table 48 on page 8-240
Roller, feed	RB2-6302-000CN	Table 53 on page 8-250
Roller, feed	RB2-6318-000CN	Table 53 on page 8-250
Roller, feed	RB2-3490-000CN	Table 58 on page 8-260
Roller, feed	RB2-6476-000CN	Table 63 on page 8-270
Roller, feed	RB2-6476-000CN	Table 63 on page 8-270
Roller, paper pick-up	RB2-2891-000CN	Table 53 on page 8-250
Roller, paper pick-up	RB2-6304-000CN	Table 53 on page 8-250
Roller, paper pick-up	RB2-6304-000CN	Table 63 on page 8-270
Roller, pick-up	RB2-2900-000CN	Table 48 on page 8-240
Roller, pressure	RB2-6368-000CN	Table 54 on page 8-252
Screw, M3 by 6	XA9-0904-000CN	Table 52 on page 8-248
Screw, M4 by 10	XA9-0606-000CN	Table 46 on page 8-236
Screw, M4 by 8	XA9-0605-000CN	Table 56 on page 8-256
Screw, M4 by 8	XA9-0605-000CN	Table 58 on page 8-260
Screw, M4 by 8	XA9-0605-000CN	Table 61 on page 8-266
Screw, M4 by 8	XA9-0605-000CN	Table 63 on page 8-270
Screw, machine, truss head, M3 by 6	XB1-2300-605CN	Table 52 on page 8-248
Screw, RS, M3 by 6	XA9-0686-000CN	Table 50 on page 8-244
Screw, TP, M3 by 4	XB6-7300-407CN	Table 46 on page 8-236
Screw, TP, M3 by 6	XA9-1223-000CN	Table 47 on page 8-238
Screw, TP, M3 by 6	XA9-1223-000CN	Table 52 on page 8-248
Screw, TP, M4 by 12	XA9-1273-000CN	Table 46 on page 8-236
Screw, TP, M4 by 6	XB6-7400-609CN	Table 59 on page 8-262
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 44 on page 8-232
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 45 on page 8-234
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 46 on page 8-236
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 48 on page 8-240
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 49 on page 8-242
Screw, TP, pan head M4 by 10	XB4-7401-007CN	Table 50 on page 8-244
Screw, TP, truss head M4 by 20	XB4-740-007CN	Table 45 on page 8-234
Screw, TP, truss head M4 by 8	XB4-7400-809CN	Table 53 on page 8-250
Screw, TP, truss head, M3 by 8	XB6-7400-809CN	Table 64 on page 8-272
Screw, w/washer M3 by 8	XA9-0924-000CN	Table 58 on page 8-260
Screw, w/washer, M3 by 6	XB2-7300-607CN	Table 46 on page 8-236
Screw, w/washer, M3 by 6	XB2-7300-607CN	Table 50 on page 8-244
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 51 on page 8-246
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 54 on page 8-252
Screw, w/washer, M3 by 8	XA9-1226-000CN	Table 63 on page 8-270
Screw, w/washer, M4 by 12	XA9-1206-000CN	Table 50 on page 8-244

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Screw, w/washer, M4 by 6	XB2-7400-607CN	Table 58 on page 8-260
Screw, w/washer, M4 by 6	XB4-7400-607CN	Table 63 on page 8-270
Screw, with star washer, M3 by 7	XB2-7300-407CN	Table 52 on page 8-248
Sensor cable	RG5-5583-000CN	Table 53 on page 8-250
Sensor cable	RG5-4278-000CN	Table 58 on page 8-260
Sensor Cable	RG5-5631-000CN	Table 63 on page 8-270
Shaft, coupling	RB2-2935-000CN	Table 52 on page 8-248
Shaft, drive	RB2-3073-000CN	Table 49 on page 8-242
Shaft, drive	RB2-2893-000CN	Table 53 on page 8-250
Shaft, drive	RB9-0681-000CN	Table 53 on page 8-250
Shaft, drive	RB2-2893-000CN	Table 64 on page 8-272
Shaft, drive, front	RB2-6269-000CN	Table 49 on page 8-242
Shaft, drive, rear	RB2-6274-000CN	Table 49 on page 8-242
Shaft, gear	RB2-6320-000CN	Table 53 on page 8-250
Sheet, separation	RB2-3007-000CN	Table 57 on page 8-258
Sheet, separation	RB2-3007-000CN	Table 62 on page 8-268
Solenoid	RH7-5270-000CN	Table 46 on page 8-236
Solenoid	RH7-5273-000CN	Table 46 on page 8-236
Solenoid	RH7-5213-000CN	Table 59 on page 8-262
Solenoid	RH7-5276-000CN	Table 64 on page 8-272
Spring, compression	RB2-2832-000CN	Table 48 on page 8-240
Spring, compression	RS6-2022-000CN	Table 48 on page 8-240
Spring, compression	RS6-2375-000CN	Table 48 on page 8-240
Spring, compression	RB2-6262-000CN	Table 50 on page 8-244
Spring, compression	RB2-6263-000CN	Table 50 on page 8-244
Spring, compression	RB2-6265-000CN	Table 50 on page 8-244
Spring, compression	RB2-6271-000CN	Table 50 on page 8-244
Spring, compression	RS6-2031-000CN	Table 52 on page 8-248
Spring, compression	RS6-2379-000CN	Table 52 on page 8-248
Spring, compression	RB2-2978-000CN	Table 54 on page 8-252
Spring, compression	RS6-2378-000CN	Table 54 on page 8-252
Spring, compression	RS6-2063-000CN	Table 56 on page 8-256
Spring, compression	RS6-2020-000CN	Table 57 on page 8-258
Spring, compression	RS6-2021-000CN	Table 57 on page 8-258
Spring, compression	RS6-2064-000CN	Table 58 on page 8-260
Spring, compression	RS6-2063-000CN	Table 61 on page 8-266
Spring, compression	RS6-2395-000CN	Table 62 on page 8-268
Spring, compression	RS6-2396-000CN	Table 62 on page 8-268
Spring, compression	RS6-2064-000CN	Table 63 on page 8-270
Spring, leaf	RB2-6266-000CN	Table 49 on page 8-242

Table 66. Alphabetical parts list (continued)

Description	Part number	Table and page
Spring, leaf	RB2-3012-000CN	Table 57 on page 8-258
Spring, leaf	RB2-3478-000CN	Table 59 on page 8-262
Spring, leaf	RB2-6450-000CN	Table 63 on page 8-270
Spring, leaf	RB2-6451-000CN	Table 63 on page 8-270
Spring, leaf, grounding	RB2-3075-000CN	Table 49 on page 8-242
Spring, tension	RS6-2025-000CN	Table 48 on page 8-240
Spring, tension	RS6-2030-000CN	Table 49 on page 8-242
Spring, tension	RB2-6314-000CN	Table 53 on page 8-250
Spring, tension	RS6-2061-000CN	Table 59 on page 8-262
Spring, tension	RS6-2062-000CN	Table 59 on page 8-262
Spring, tension	RS6-2061-000CN	Table 64 on page 8-272
Spring, tension	RS6-2397-000CN	Table 64 on page 8-272
Spring, torsion	RB2-2837-000CN	Table 46 on page 8-236
Spring, torsion	RB2-2843-000CN	Table 48 on page 8-240
Spring, torsion	RB2-6308-000CN	Table 53 on page 8-250
Spring, torsion	RB2-6321-000CN	Table 53 on page 8-250
Spring, torsion	RB2-6352-000CN	Table 54 on page 8-252
Static charge eliminator	RB2-6281-000CN	Table 45 on page 8-234
Swing gear assembly	RF5-2755-000CN	Table 59 on page 8-262
Transfer roller assembly	RG5-5581-000CN	Table 48 on page 8-240
Tray assembly, (tray 1)	RG5-5576-000CN	Table 44 on page 8-232
Washer	RB2-2949-000CN	Table 52 on page 8-248

Numerical parts list

Table 67. Numerical parts list

Part number	Description	Table and page
C4209-60001	Formatter PCB	Table 47 on page 8-238
C7058-00001	RFI shield, formatter	Table 47 on page 8-238
RB1-2190-000CN	Collar, spring	Table 59 on page 8-262
RB1-2190-000CN	Collar, spring	Table 64 on page 8-272
RB1-6133-000CN	Holder, spring	Table 59 on page 8-262
RB1-6133-000CN	Holder, spring	Table 64 on page 8-272
RB2-2816-000CN	Foot	Table 56 on page 8-256
RB2-2830-020CN	Guide, cartridge, right	Table 48 on page 8-240
RB2-2831-020CN	Guide, cartridge, left	Table 48 on page 8-240
RB2-2832-000CN	Spring, compression	Table 48 on page 8-240
RB2-2836-000CN	Lever, sensor	Table 46 on page 8-236
RB2-2837-000CN	Spring, torsion	Table 46 on page 8-236
RB2-2843-000CN	Spring, torsion	Table 48 on page 8-240
RB2-2849-000CN	Roller, face-down lower 1	Table 48 on page 8-240
RB2-2849-000CN	Roller, face-down lower 1	Table 48 on page 8-240
RB2-2850-000CN	Bushing	Table 48 on page 8-240
RB2-2856-000CN	Cover, cartridge	Table 45 on page 8-234
RB2-2891-000CN	Roller, paper pick-up	Table 58 on page 8-260
RB2-2892-000CN	Roller	Table 53 on page 8-250
RB2-2892-000CN	Roller	Table 58 on page 8-260
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RB2-2895-000CN	Bushing, right	Table 58 on page 8-260
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RB2-2896-000CN	Bushing, left	Table 53 on page 8-250
RB2-2896-000CN	Bushing, left	Table 58 on page 8-260
RB2-2896-000CN	Bushing, left	Table 63 on page 8-270
RB2-2897-020CN	Bushing	Table 53 on page 8-250
RB2-2900-000CN	Roller, pick-up	Table 48 on page 8-240
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RB2-2935-000CN	Shaft, coupling	Table 52 on page 8-248
RB2-2936-000CN	Bushing	Table 52 on page 8-248
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RB2-2947-000CN	Holder, pin	Table 52 on page 8-248
RB2-2949-000CN	Washer	Table 52 on page 8-248
RB2-2950-000CN	Flange, spring	Table 52 on page 8-248
RB2-2973-000CN	Bushing	Table 54 on page 8-252
RB2-2978-000CN	Spring, compression	Table 54 on page 8-252
RB2-3000-000CN	Cover, front	Table 57 on page 8-258
RB2-3001-040CN	Body, cassette	Table 57 on page 8-258
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RB2-3007-000CN	Sheet, separation	Table 57 on page 8-258
RB2-3007-000CN	Sheet, separation	Table 62 on page 8-268
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RB2-3009-000CN	Arm, lock	Table 57 on page 8-258
RB2-3010-000CN	Arm, paper level	Table 57 on page 8-258
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RB2-3044-000CN	Bushing, right	Table 48 on page 8-240
RB2-3046-000CN	Roller	Table 53 on page 8-250
RB2-3073-000CN	Shaft, drive	Table 49 on page 8-242
RB2-3075-000CN	Spring, leaf, grounding	Table 49 on page 8-242
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RB2-3474-000CN	Lever, sensor	Table 58 on page 8-260
RB2-3475-000CN	Bushing	Table 59 on page 8-262
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RB2-6261-000CN	Eliminator, static charge	Table 46 on page 8-236
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RB2-6272-000CN	Belt, paper feed, 1	Table 49 on page 8-242
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RB2-6297-000CN	Foot, rubber	Table 48 on page 8-240
RB2-6297-000CN	Foot, rubber	Table 61 on page 8-266
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RB2-6303-000CN	Bushing	Table 53 on page 8-250
RB2-6304-000CN	Roller, paper pick-up	Table 53 on page 8-250
RB2-6304-000CN	Roller, paper pick-up	Table 63 on page 8-270
RB2-6308-000CN	Spring, torsion	Table 53 on page 8-250
RB2-6309-000CN	Arm, roller holder	Table 53 on page 8-250
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RB2-6314-000CN	Spring, tension	Table 53 on page 8-250
RB2-6318-000CN	Roller, feed	Table 53 on page 8-250
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RB2-6349-000CN	Plate, end	Table 57 on page 8-258
RB2-6350-000CN	Guide, delivery, lower	Table 54 on page 8-252
RB2-6351-000CN	Lever, delivery	Table 54 on page 8-252
RB2-6352-000CN	Spring, torsion	Table 54 on page 8-252
RB2-6357-000CN	Guide, entrance	Table 54 on page 8-252
RB2-6358-000CN	Plate, Pressure	Table 54 on page 8-252
RB2-6359-000CN	Bushing	Table 54 on page 8-252
RB2-6368-000CN	Roller, pressure	Table 54 on page 8-252
RB2-6370-000CN	Bushing	Table 54 on page 8-252
RB2-6371-000CN	Bushing	Table 54 on page 8-252
RB2-6372-000CN	Roller, delivery	Table 54 on page 8-252
RB2-6374-000CN	Roller, delivery	Table 54 on page 8-252
RB2-6376-000CN	Arm, drive	Table 52 on page 8-248
RB2-6377-000CN	Plate, motor	Table 52 on page 8-248
RB2-6378-000CN	Plate, spring	Table 52 on page 8-248
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RB2-6448-000CN	Arm, sensor	Table 63 on page 8-270
RB2-6450-000CN	Spring, leaf	Table 63 on page 8-270
RB2-6451-000CN	Spring, leaf	Table 63 on page 8-270
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RB2-6456-000CN	Cover, right	Table 61 on page 8-266
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RB2-6459-000CN	Arm, pad	Table 62 on page 8-268
RB2-6463-000CN	Cover, right edge	Table 62 on page 8-268
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RB2-6465-000CN	Arm, paper level	Table 62 on page 8-268
RB2-6466-000CN	Plate, grounding	Table 62 on page 8-268
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RB2-6470-000CN	Bushing, left	Table 63 on page 8-270
RB2-6471-000CN	Gear, 20T	Table 62 on page 8-268
RB2-6473-000CN	Plate, solenoid cross member	Table 64 on page 8-272
RB2-6474-000CN	Pad, separation	Table 62 on page 8-268
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RB2-6476-000CN	Roller, feed	Table 63 on page 8-270

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RF5-3272-000CN	Pad, separation	Table 49 on page 8-242
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RF5-3279-000CN	Holder, sensor lever	Table 46 on page 8-236
RF5-3303-000CN	Plate, paper lifting	Table 62 on page 8-268
RF5-3304-000CN	Gear, 31T/26T	Table 64 on page 8-272
RG5-4121-000CN	Cover assembly, tray 1	Table 44 on page 8-232
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RG5-4281-000CN	FG cable	Table 63 on page 8-270
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RS6-0450-000CN	Gear, 31T	Table 52 on page 8-248
RS6-0451-000CN	Gear, 26T	Table 52 on page 8-248
RS6-0464-000CN	Gear, 20T	Table 49 on page 8-242
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RS6-2061-000CN	Spring, tension	Table 59 on page 8-262
RS6-2061-000CN	Spring, tension	Table 64 on page 8-272
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